

**TOSHIBA**

FILE NO. 030-9803

**SERVICE MANUAL**

**COLOUR TELEVISION**

C80 Chassis

**1480TB, 1480TBW**

**1480RB, 1480RBW**

## TABLE OF CONTENTS

### **CHAPTER 1 GENERAL ADJUSTMENTS**

SAFETY INSTRUCTIONS .....	3
SET-UP ADJUSTMENT .....	4
SERVICE AND DESIGN MODE .....	6
ELECTRICAL ADJUSTMENT .....	7
CIRCUIT CHECK.....	12

### **CHAPTER 2 SPECIFIC INFORMATIONS**

SETTING & ADJUSTING DATA .....	13
LOCATION OF CONTROLS .....	14
CIRCUIT BLOCK DIAGRAM .....	16
CHASSIS AND CABINET REPLACEMENT PARTS LIST .....	17
PC BOARDS BOTTOM VIEW .....	23
TERMINAL VIEW OF TRANSISTORS .....	26
SPECIFICATIONS .....	29
APPENDIX:	
CIRCUIT DIAGRAMS	

## CHAPTER 1 GENERAL ADJUSTMENTS

### SAFETY INSTRUCTIONS

**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" INSTRUCTIONS BELOW.

#### X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is  $\textcircled{A}$  kV at zero beam current (minimum brightness) under a  $\textcircled{C}$  VAC power source. The high voltage must not, under any circumstances, exceed  $\textcircled{B}$  kV.
2. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
3. Some part in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE below.

Refer to table-1 for high voltage  $\textcircled{A}$ ,  $\textcircled{B}$  & AC voltage  $\textcircled{C}$  (See SETTING & ADJUSTING DATA on page 13)

Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure in this manual. It is recommended that the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.

#### SAFETY PRECAUTION

**WARNING :** Service should not be attempted by anyone unfamiliar with the necessary precautions on this receiver. The following are the necessary precautions to be observed before servicing this chassis.

1. An isolation transformer should be connected in the power line between the receiver and the AC line before any service is performed on the receiver.
2. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled. Use shatter proof goggles and keep picture tube away from the unprotected body while handling.
3. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as; non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.

#### PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the international hazard symbols on the schematic diagram and the parts list.

Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire, X-ray radiation or other hazards.

**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 3 OF THIS MANUAL.

## SET-UP ADJUSTMENT

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed. Perform the adjustments in order as follows :

- Color Purity
- Convergence
- White Balance

Note: The PURITY/CONVERGENCE MAGNET assembly and rubber wedges need mechanical positioning.  
Refer to figure 1.

- \* There are no adjustment of purity and convergence in some picture tube (Unified with purity magnet)

### COLOR PURITY ADJUSTMENT

NOTE : Before attempting any purity adjustments, the receiver should be operated for at least fifteen minutes.

- Demagnetize the picture tube and cabinet using a degaussing coil.
- Set the brightness and contrast to maximum.
- Use a green raster from among the built-in test signals.
- Loosen the clamp screw holding the yoke and slide the yoke backward or forward to provide vertical green belt (zone) in the picture screen.

- Remove the Rubber Wedges.
- Rotate and spread the tabs of the purity magnet (See figure 2.) around the neck of the picture tube until the green belt is in the center of the screen. At the same time, enter the raster vertically.
- Slowly move the yoke forward or backward until a uniform green screen is obtained. Tighten the clamp screw of the yoke temporarily.
- Check the purity of the red and blue raster.

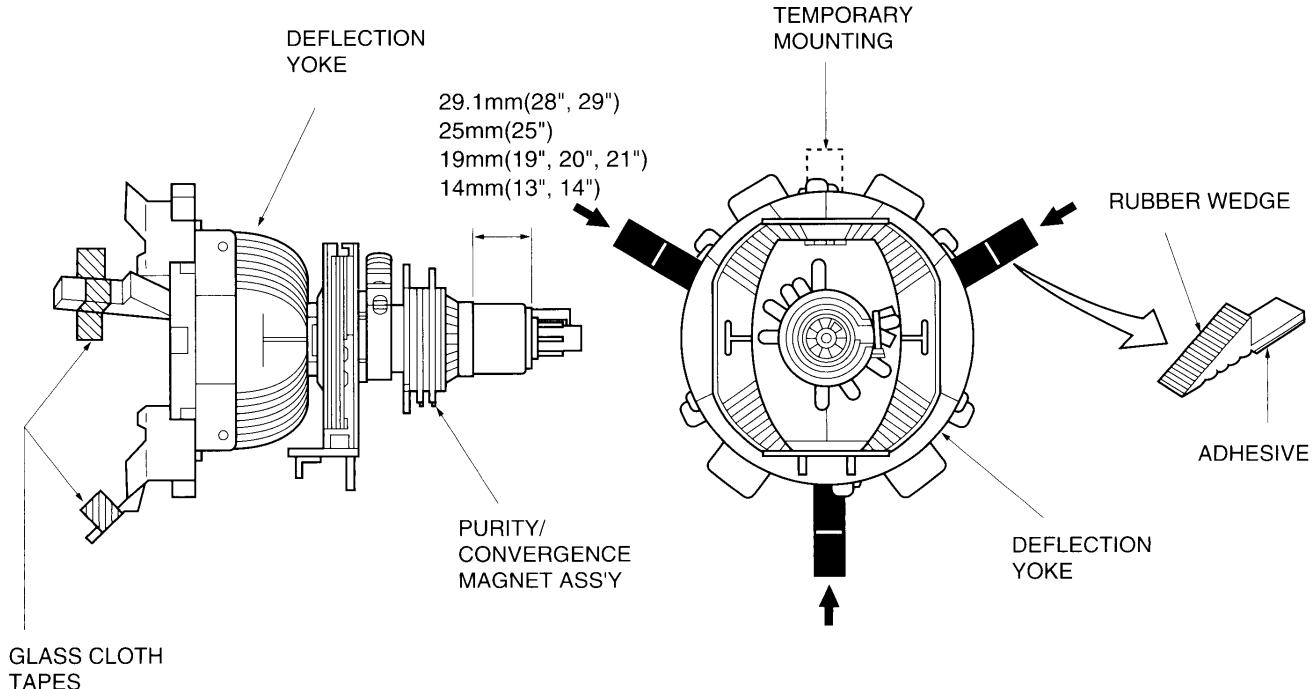


Figure 1.

## CONVERGENCE ADJUSTMENTS

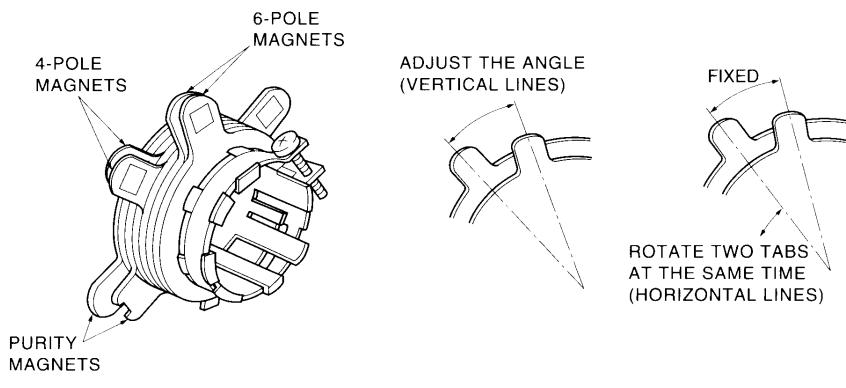
NOTE: Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

### CENTER CONVERGENCE ADJUSTMENT

1. Use the cross-dot pattern from among the built-in test signals.
2. Set the brightness and contrast for well defined pattern.
3. Adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure 2.) and superimpose red and blue vertical lines in the center area of the picture screen.
4. Turn the both tabs at the same time keeping the angle constant to superimpose red and blue horizontal lines at the center of the screen.
5. Adjust two tabs of 6-Pole Magnets to superimpose red/blue line and green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6. Repeat adjustments 3, 4, 5 keeping in mind red, green and blue movement, because 4-Pole Magnets and 6-Pole Magnets have mutual interaction and make dot movement complex.

### CIRCUMFERENCE CONVERGENCE ADJUSTMENT

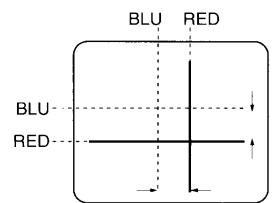
1. Loosen the clamping screw of deflection yoke slightly to allow the yoke to tilt.
2. Temporarily put a wedge as shown in figure 1. (Do not remove cover paper on adhesive part of the wedge.)
3. Tilt front of the deflection yoke up or down to obtain better convergence in circumference. (See figure 3.) Push the mounted wedge into the space between picture tube and the yoke to fix the yoke temporarily.
4. Put other wedge into bottom space and remove the cover paper to stick.
5. Tilt front of the yoke right or left to obtain better convergence in circumference. (See figure 3.)
6. Keep the yoke position and put another wedge in either upper space. Remove cover paper and stick the wedge on picture tube to fix the yoke.
7. Detach the temporarily mounted wedge and put it in another upper space. Stick it on picture tube to fix the yoke.
8. After fixing three wedges, recheck overall convergence. Tighten the screw firmly to fix the yoke and check the yoke is firm.
9. Stick three adhesive tapes on wedges as shown in figure 1.



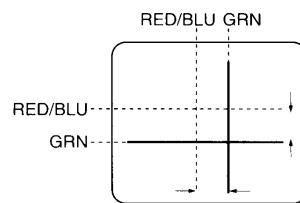
CONVERGENCE MAGNET ASSEMBLY

ADJUSTMENT OF MAGNETS

Figure 2.

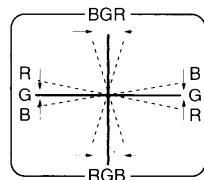


4-POLE MAGNETS MOVEMENT

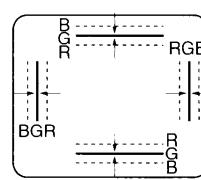


6-POLE MAGNETS MOVEMENT

Center Convergence by Convergence Magnets



INCLINE THE YOKE UP (OR DOWN)



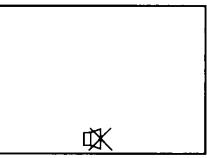
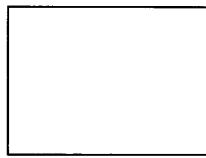
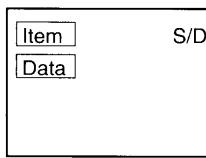
INCLINE THE YOKE RIGHT (OR LEFT)

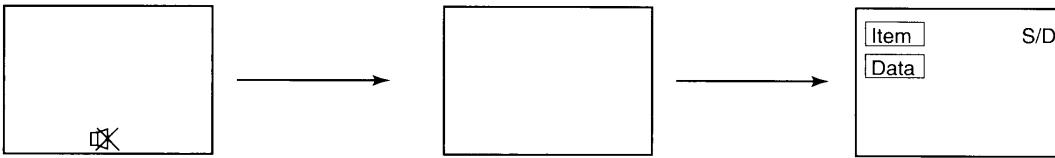
Circumference Convergence by DEF Yoke

Figure 3. Dot Movement Pattern

## SERVICE AND DESIGN MODE

### 1. ENTERING TO SERVICE AND DESIGN MODE

- 1) Press  button once on Remote Control.
- 2) Press  button again to keep pressing.
- 3) While pressing the  button, press Vol Down  – button on TV set.



(Service mode display)

### 2. KEY FUNCTION IN THE SERVICE MODE

The following key entry during display of adjustment menu provides special functions.

A single horizontal line ON/OFF:	- / - button (on Remote)
Selection of the adjustment items :	CHANNEL  /  (on TV or Remote)
Change of the data value :	VOLUME  /+/- (on TV or Remote)
Initialization of the memory (QA02) :	CALL + CHANNEL button on TV (  )
I <sup>2</sup> C BUS ON/OFF :	CALL+VOL  + UP.
ASM start :	CALL+VOL  - DOWN.
Automatic VCO adjustment :	0 button.
"RCUT" selection :	1 button
"GCUT" selection :	2 button
"BCUT" selection :	3 button
"CNTX" (or "SCNT") selection :	4 button
"COLC" selection :	5 button- - - Color thickness correction
"TNTC" selection :	6 button note: Displayed differently as shown below, depending on the setting of the receiving color system.
"SECAM R-Y offset" selection	7 button
"SECAM B-Y offset" selection	8 button COLP (PAL) COLC (NTSC) COLS (SECAM)

CAUTION : Never try to perform initialization unless you have changed the memory IC.

### 3. SELECTING THE ADJUSTING ITEMS

- 1) Every pressing of CHANNEL  button in the service mode changes the adjustment items in the order of table-2.  
( button for reverse order)

Refer to table-2 for preset data of adjustment mode.  
(See SETTING & ADJUSTING DATA on page 13)

### 4. ADJUSTING THE DATA

- 1) Pressing of VOLUME /+/- button will change the value of data in the range from 00H to FFH. The variable range depends on the adjusting item.

### 5. EXIT FROM SERVICE MODE

- 1) Pressing POWER button to turn off the TV once.

#### ■ INITIALIZATION OF MEMORY DATA OF QA02

After replacing QA02, the following initialization is required.

1. Enter the service mode, then select any register item.
2. Press and hold the CALL button on the Remote, then press the CHANNEL  button on the TV. The initialization of QA02 has been completed.
3. Check the picture carefully. If necessary, adjust any adjustment item above.  
Perform "Auto search Memory".

CAUTION: Never attempt to initialize the data unless QA02 has been replaced.

## ELECTRICAL ADJUSTMENTS

### Model C80 Series (Reference factory adjustments)

Item: [AFT],[LAFT],[RAGC],[LAGC]

**The entire set (including the micro) must be powered for this alignment**

**For sets using the TB1231N Chroma Device the following method must be used:**

UK / German Sets (1480TB,1480RB,1480RD,2181TB,2180TD) initial batches only:

- 1) Disconnect IF Pad, and set service and design mode.
- 2) Apply IF Carrier Signal at 38.9MHz/95dBuV (39.5MHz/95dBuV for UK) to the cct side of the IF pad.
- 3) Ensure Bus-Data is as follows:  
[AFT] = 40H
- 4) Attach DVM to Q501 #4 and record the voltage.
- 5) Using a ceramic trimmer adjust L161 until steep change of voltage between 0.2V and 4.8V (approximately).
- 6) Set the coil to get 2.5V (i.e. the centre of the slope).
- 7) Disconnect the DVM
- 8) Select RAGC in the service mode and adjust the RF-AGC of the tuner becomes 4V by pushing VOL  $\Delta/-/+$  buttons on the remote.
- 9) Disconnect IF Signal Generator
- 10) Re-solder IF Pad.

**For sets using the TB1238N Chroma Device the following method must be used as it can be adjusted automatically:** (Every model after initial batches above)

UK / German Sets:

- 1) Disconnect IF Pad, and set to service and design mode.
- 2) Apply IF Carrier Signal at 38.9MHz/95dB uV (39.5MHz/95dBuV for UK) to the cct side of the IF Pad.
- 3) Push POS O button on Universal HHU then wait for "AFT OK" to appear on screen.
- 4) Select RAGC in the service mode and adjust the RF-AGC of the tuner becomes 4V by pushing VOL  $\Delta/-/+$  buttons on the remote.
- 5) Disconnect IF Signal Generator
- 6) Re-solder IF Pad.

French Sets:

- 1) Ensure Position {n} is in the UHF Band in any system
- 2) Disconnect IF Pad and and select position {n}, and set service and design mode.
- 3) Appy IF Carrier Signal of 38.9MHz/95dbuV to the cct side of the IF pad.
- 4) Push POS O button on Universal HHU then wait for "AFT OK" to appear on screen.
- 5) Select RAGC in the service mode and adjust the RF-AGC of the tuner becomes 4V by pushing VOL  $\Delta/-/+$  buttons on the remote.
- 6) Select LAGC in the Service mode and input the data value same as RAGC mode.
- 7) Disconnect IF Signal Generator and re-solder IF Pad.

**[There will be no French sets using the TB1231N V/C/D IC, all sets will eventually use the TB1238N device. The automatic system DOES NOT require a 34.47MHz signal for SECAM L alignment, as the frequencies are generated internally.]**

(The Universal HHU commands are Listed on the end of this document including AFT/AGC)

## GENERAL ADJUSTMENTS

### Item [SCNT] NO ADJUSTMENT

Name: SUB-CONTRAST

SETTING:

Input Signal:

Measurement Place:

Adjustment Method:

Standard:

### Item [BRTC]

Name: SUB-BRIGHT CENTRE

SETTING: Set user control setting to STANDARD 1

Input Signal: SUB-BRIGHT SIGNAL

Measurement Place: On Picture

Adjustment Method: Adjust the number of Black Steps visible on the picture

Standard: 4th bar from black 1.5bars

Note: Adjust last

### Item [COLP] NO ADJUSTMENT

Name: SUB-COLOUR CENTRE (PAL)

SETTING:

Input Signal:

Measurement Place:

Adjustment Method:

Standard:

## Item [TNTC] NO ADJUSTMENT { [TnTC] on REMOTE model }

Name: SUB-TINT CENTRE (M-NTSC Mode)SETTING:Input Signal:Measurement Place:Adjustment Method:Standard:

## Item [COLC] NO ADJUSTMENT

Name: SUB-COLOUR CENTRE (NTSC / PAL)SETTING:Input Signal:Measurement Place:Adjustment Method:Standard:

## Item [RCUT],[GCUT],[BCUT],[GDRV],[BDRV],[SCREEN VR]

Name: CUT-OFF/DRIVE ADJUSTSETTING: [RCUT],[GCUT],[BCUT] data set to 20H

[GDRV],[BDRV] data set to 40H

Set to Horizontal Line mode

Input Signal: White-Balance Signal (Reduced Dual Window Patten)Measurement Place: On PictureAdjustment Method:

Raise the screen VR gradually and stop in the place where the line of either R or G or B shines slightly. Set the VR position at that point.

Raise the CUT-OFF data of the two colours that did not appear first and stop when the line becomes white.

Come out of Horizontal Line mode and using white balance gear adjust [GCUT],[BCUT] in Low-Lights (4 Ft-Lbts) and [GDRV],[BDRV] in High-Lights (30 Ft-Lbts) until Standard achieved in both conditions.

Standard:103cd/m<sup>2</sup>(30 Ft-Lbts) 8750k +0.0075uv17cd/m<sup>2</sup>(4 Ft-Lbts) 8750k +0.0020uv

(Automatic may be possible, [GDRV],[BDRV] might be deleted on 14 on future models)

Item [SRY],[SBY]	{ [SR],[SY] on REMOTE model }
<p><u>Name:</u> SECAM R-Y/B-Y BLACK LEVEL SETTING</p> <p><u>SETTING:</u> COLOUR: MID</p> <p><u>Input Signal:</u> Two-tone White-Balance Signal</p> <p><u>Measurement Place:</u> On Picture</p> <p><u>Adjustment Method:</u></p> <ol style="list-style-type: none"> <li>1) Remember settings of the PAL White-Balance Adjustment on the Low-Light.</li> <li>2) Select Position 2 on the selector box and confirm that the three colour boxes are visible in the lower left hand corner of the screen.</li> <li>3) Adjust [SRY] for a reading of within 2 indicators on the <b>Green</b> scale with respect to the original results obtained from point (1) above</li> <li>4) Adjust [SBY] for a reading of within 2 indicators on the <b>Blue</b> scale with respect to the original results obtained from point (1) above</li> <li>5) Re-select position 1 on the switch box to confirm that the setting are within 2 on scale.</li> </ol> <p><u>Standard:</u></p>	

Item [COLS] NO ADJUSTMENT	
<p><u>Name:</u> SUB-COLOUR CENTRE (SECAM)</p> <p><u>SETTING:</u></p> <p><u>Input Signal:</u></p> <p><u>Measurement Place:</u></p> <p><u>Adjustment Method:</u></p> <p><u>Standard:</u></p>	

Item [VPOS] NO ADJUSTMENT	{ [VP50] on REMOTE model }
<p><u>Name:</u> VERTICAL PICTURE POSITION</p> <p><u>SETTING:</u></p> <p><u>Input Signal:</u></p> <p><u>Measurement Place:</u></p> <p><u>Adjustment Method:</u></p>	

**Item [HIT]**

Name: VERTICAL HEIGHT ADJUSTMENT

SETTING: CONTRAST=MAX BRIGHT=CENTRE COLOUR=CENTRE

Input Signal: WG Philips Pattern (Do not use French SECAM)

Measurement Place: On Picture

Adjustment Method: Adjust the [HIT] Bus-Data until castellations just disappear from Top and Bottom of picture

**Item [HOPS]**

Name: HORIZONTAL PICTURE POSITION

SETTING: CONTRAST=MAX BRIGHT=CENTRE COLOUR=CENTRE

Input Signal: WG Philips Pattern (Do not use French SECAM)

Measurement Place: On Picture

Adjustment Method: Adjust the [HOPS] Bus-Data for the best Horizontal centring

## CIRCUIT CHECKS

### HIGH VOLTAGE CHECK

**CAUTION:** There is no HIGH VOLTAGE ADJUSTMENT on this chassis. Checking should be done following the steps below.

1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage must be measured below  $\textcircled{B}$  kV.

Refer to table-1 for high voltage  $\textcircled{B}$ .  
(See SETTING & ADJUSTING DATA on page 13)

4. Vary the BRIGHTNESS control to both extremes to be sure the high voltage does not exceed the limit under any conditions.

## CHAPTER 2 SPECIFIC INFORMATIONS

### SETTING & ADJUSTING DATA

#### 【SAFETY INSTRUCTIONS】

		14"
HIGH VOLTAGE AT ZERO BEAM:	(A)	23.8kV
MAX HIGH VOLTAGE:	(B)	26.0 kV
AC VOLTAGE	(C)	220~240V

Table-1

#### 【SERVICE MODE】

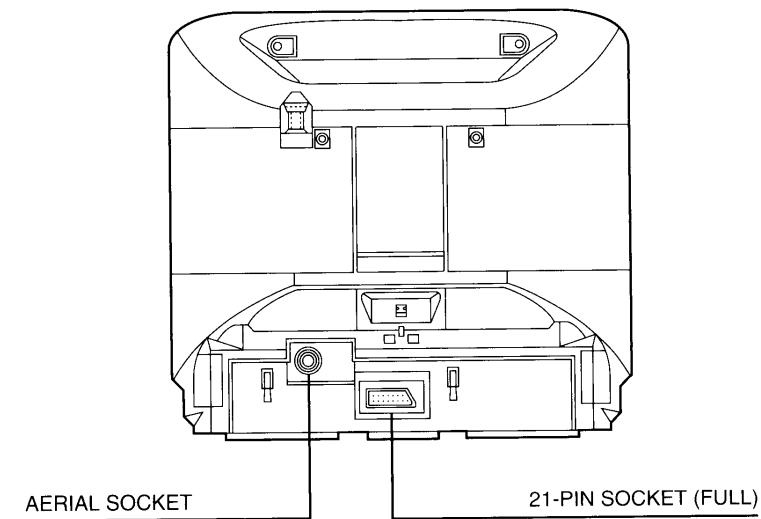
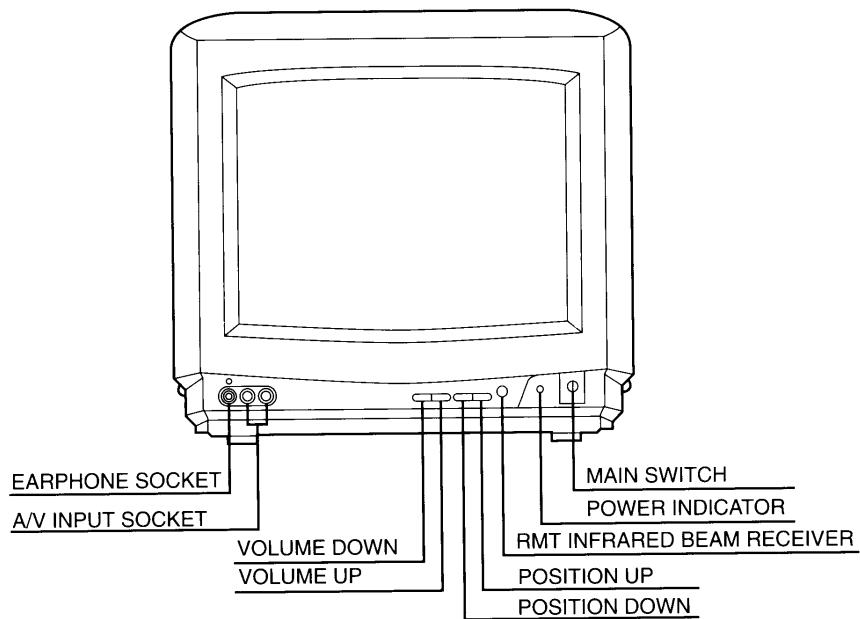
##### ADJUSTING ITEMS AND DATA IN THE SERVICE AND DESIGN MODE:

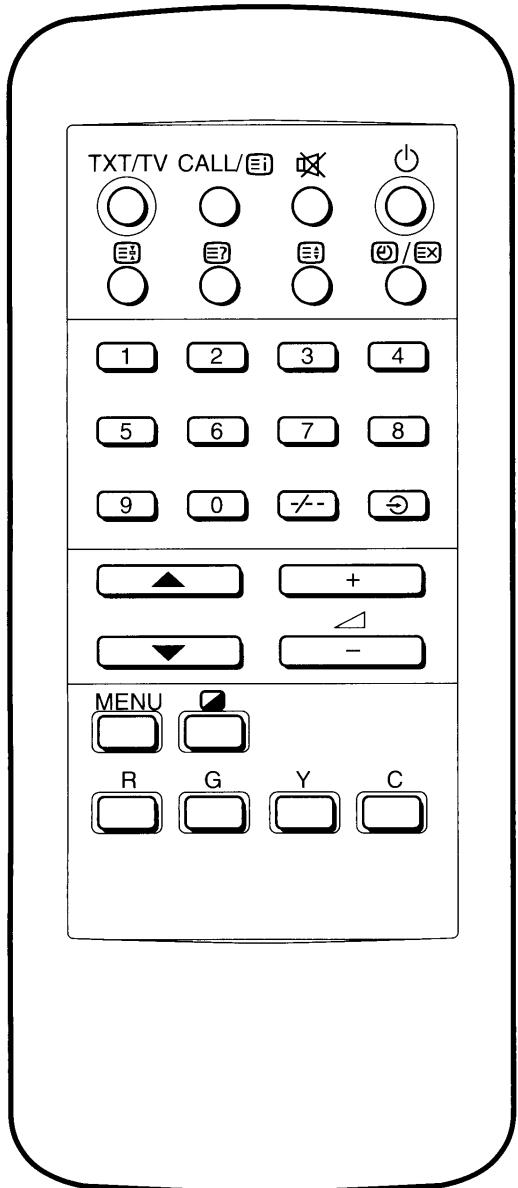
Item	Name of adjustment	Preset	Data
RCUT	R CUTOFF	20H	←
GCUT	G CUTOFF	20H	←
BCUT	B CUTOFF	20H	←
GDRV	G DRIVE	40H	←
BDRV	B DRIVE	40H	←
SCNT	SUB-CONTRAST	05H	07H
BRTC	SUB-BRIGHT	40H	31H
COLC	SUB-COLOR	00H	←

Item	Name of adjustment	Preset	Data
TNTC	SUB-TINT	3CH	←
COLS	SUB COLOR CEN SEC	40H	←
HPOS	HORIZ. POSITION	11H	13H
VP50	VERT. POSITION	03H	OCH
HIT	HEIGHT	20H	←
VLIS	50/60HZ V-LINE	FFH	00H
SBY	SECAM OFFSET B-Y	08H	09H
SRY	SECAM OFFSET B-Y	08H	0DH

Table-2

## LOCATION OF CONTROLS



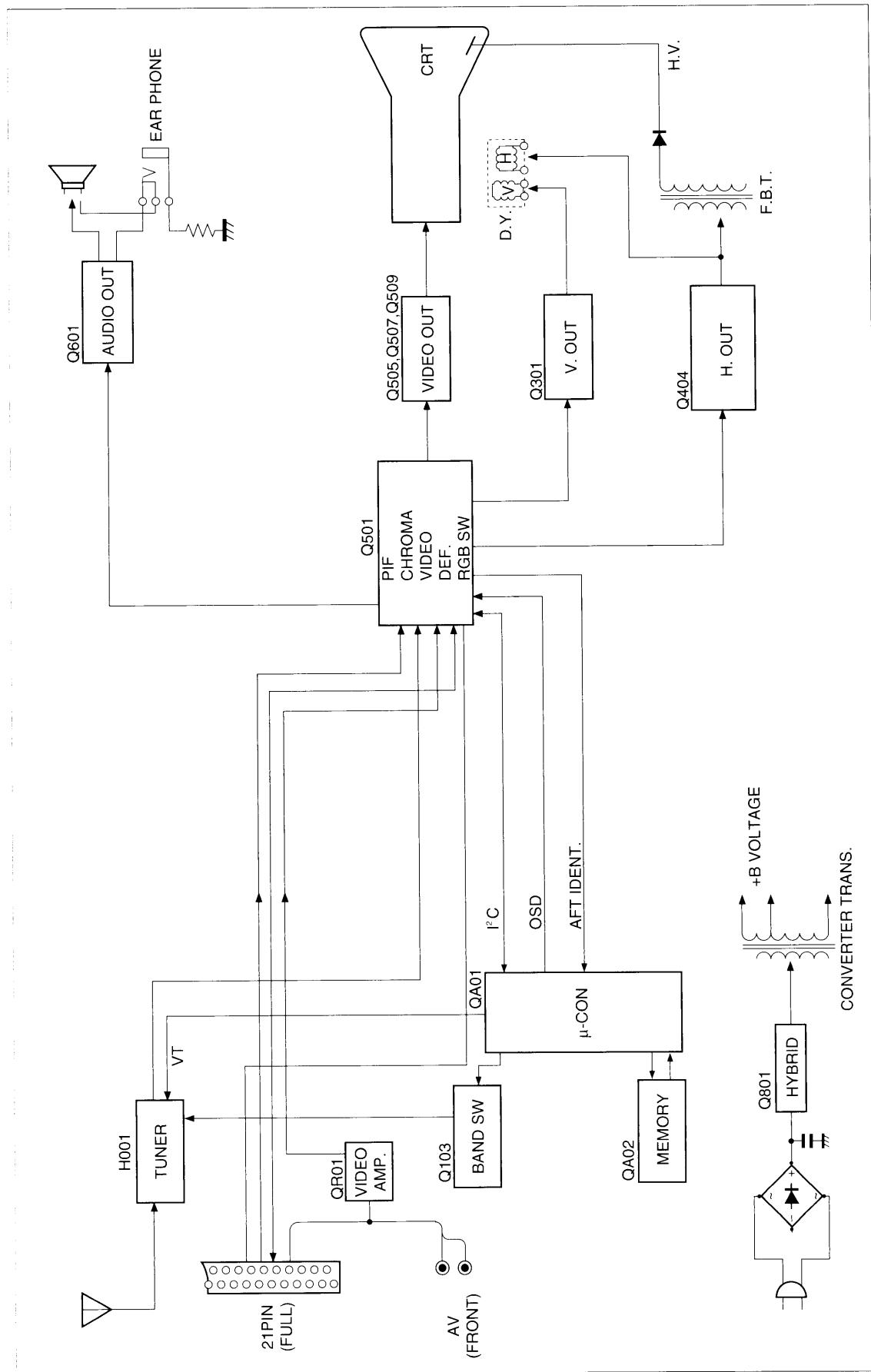


#### KEY ASSIGNMENT

- ∅ ..... ON/STAND-BY
- ☒ ..... MUTE
- CALL ..... DISPLAY CALL
- MENU ..... TUNING & OTHER MENU
- ☒ ..... PICTURE MENU
- 1~9,0 ..... TEN KEY
- /- ..... 1 or 2 place
- ⌚ ..... VIDEO INPUT (EXTERNAL INPUT SOURCE SW.)
- △ ..... VOLUME
- + ..... LEVEL PLUS (VOLUME, MENU)
- ..... LEVEL MINUS (VOLUME, MENU)
- ▲ ..... UP (POSI., CH., TEXT PAGE)
- ▼ ..... DOWN (POSI., CH., TEXT PAGE)
- TXT/TV ..... TEXT, MIX, TV MODE SW.
- ☒ ..... HOLD
- ⌚ ..... <TEXT MODE> REVEAL / CONCEAL
- ⌚ ..... <TEXT MODE> F-T-B  
(FULL, TOP, BOTTOM)
- ⌚/☒ ..... TIME DISPLAY (TV MODE)
- ⌚ ..... TEXT CLEAR (TEXT MODE)
- ⌚ ..... INDEX, INITIAL
- FLOF COLOUR KEY (4 key used)  
Red/Green/Yellow/Blue

## SPECIFIC INFORMATION

## CIRCUIT BLOCK DIAGRAM



## CHASSIS AND CABINET REPLACEMENT PARTS LIST

**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 3 OF THIS MANUAL.

**CAUTION:** The international hazard symbols "⚠" in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE. Do not degrade the safety of the receiver through improper servicing.

**NOTICE:**

- The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.
- The PC board assembly with \* mark is no longer available after the end of the production.

**Model : 1470TB/1470TBW/1470RB/1470RBW**

Capacitors .....	CD : Ceramic Disk	PF : Plastic Film	EL : Electrolytic
Resistors .....	CF : Carbon Film	CC : Carbon Composition	MF : Metal Film
	OMF : Oxide Metal Film	VR : Variable Resistor	FR : Fusible Resistor

(All CD and PF capacitors are ±5%, 50V and all resistors, ±5%, 1/6W unless otherwise noted.)

Location No.	Part No.	Description
<b>CAPACITORS</b>		
C102	24232103	CD, 0.01μF, +80%, -20%
C104	24232103	CD, 0.01μF, +80%, -20%
C106	24232103	CD, 0.01μF, +80%, -20%
C107	24794102	EL, 1000μF, ±20%, 16V
C111	24538104	PF, 0.1μF
C131	24538474	PF, 0.47μF
C132	24474102	CD, 1000pF, ±10%
C133	24474102	CD, 1000pF, ±10%
C161	24794101	EL, 100μF, ±20%, 16V
C162	24473560	CD, 56pF
C163	24473560	CD, 56pF
C168	24232103	CD, 0.01μF, +80%, -20%
C190	24232103	CD, 0.01μF, +80%, -20%
C193	24797229	EL, 2.2μF, ±20%, 50V
C195	24232103	CD, 0.01μF, +80%, -20%
C196	24538104	PF, 0.1μF
C197	24538104	PF, 0.1μF
C198	24538104	PF, 0.1μF
C199	24232103	CD, 0.01μF, +80%, -20%
C202	24206010	EL, 1μF, 50V
C203	24206228	EL, 0.22μF, 50V
C204	24590222	PF, 2200pF
C205	24473100	CD, 10pF
C207	24538104	PF, 0.1μF
C208	24538104	PF, 0.1μF
C209	24538104	PF, 0.1μF
C210	24794101	EL, 100μF, ±20%, 16V
C211	24232103	CD, 0.01μF, +80%, -20%
C212	24473100	CD, 10pF
C213	24473100	CD, 10pF
C214	24473100	CD, 10pF
C215	24797100	EL, 10μF, ±20%, 50V
C217	24797010	EL, 1μF, ±20%, 50V
C219	24538474	PF, 0.47μF
C220	24212152	CD, 1500pF, ±10%
C221	24232103	CD, 0.01μF, +80%, -20%
C222	24795471	EL, 470μF, ±20%, 25V
C223	24666470	EL, 47μF, ±20%, 16V
C224	24232103	CD, 0.01μF, +80%, -20%
C227	24669010	EL, 1μF, ±20%, 50V

Location No.	Part No.	Description
C228	24590203	PF, 0.02μF
C229	24797478	EL, 0.47μF, ±20%, 50V
C230	24797478	EL, 0.47μF, ±20%, 50V
C231	24797478	EL, 0.47μF, ±20%, 50V
C232	24797478	EL, 0.47μF, ±20%, 50V
C234	24232103	CD, 0.01μF, +80%, -20%
C235	24794101	EL, 100μF, ±20%, 16V
C236	24797478	EL, 0.47μF, ±20%, 50V
C237	24212332	CD, 3300pF, ±10%
C238	24232103	CD, 0.01μF, +80%, -20%
C239	24794101	EL, 100μF, ±20%, 16V
C240	24538474	PF, 0.47μF
C241	24474101	CD, 100pF, ±10%
C242	24474221	CD, 220pF, ±10%
C243	24794101	EL, 100μF, ±20%, 16V
C244	24232103	CD, 0.01μF, +80%, -20%
C245	24794220	EL, 22μF, ±20%, 16V
C306	24212391	CD, 390pF, ±10%
C312	24590823	PF, 0.082μF
C313	24668101	EL, 100μF, ±20%, 35V
C314	24214102	CD, 1000pF, ±10%, 500V
C317	24617912	EL, 2.2μF, ±10%, 50V
C318	24666472	EL, 4700μF, ±20%, 16V
C323	24082049	PF, 0.047μF, 100V
C325	24668101	EL, 100μF, ±20%, 35V
C331	24668102	EL, 1000μF, ±20%, 35V
C332	24082057	PF, 0.22μF, 100V
C402	24797478	EL, 0.47μF, ±20%, 50V
C410	24082261	PF, 5600pF, 100V
C416	24214102	CD, 1000pF, ±10%, 500V
△ C440	24082347	PF, 6700pF, ±3%, 1500V
C442	24095753	PF, 0.39μF, 200V
C445	24095903	PF, 0.056μF, ±10%, 250V
C446	24666471	EL, 470μF, ±20%, 16V
C447	24679479	EL, 4.7μF, ±20%, 250V
C448	24640908	EL, 33μF, ±20%, 160V
C449	24667102	EL, 1000μF, ±20%, 25V
△ C463	24212152	CD, 1500pF, ±10%
C470	24666220	EL, 22μF, ±20%, 16V
C471	24538474	PF, 0.47μF
C481	24666220	EL, 22μF, ±20%, 16V

## SPECIFIC INFORMATIONS

Location No.	Part No.	Description
C482	24666101	EL, 100 $\mu$ F, ±20%, 16V
C601	24795471	EL, 470 $\mu$ F, ±20%, 25V
C602	24538104	PF, 0.1 $\mu$ F
C603	24795221	EL, 220 $\mu$ F, ±20%, 25V
C605	24206010	EL, 1 $\mu$ F, 50V
C606	24795220	EL, 22 $\mu$ F, ±20%, 25V
C607	24590682	PF, 6800pF
C608	24797010	EL, 1 $\mu$ F, ±20%, 50V
C609	24794470	EL, 47 $\mu$ F, ±20%, 16V
C610	24206010	EL, 1 $\mu$ F, 50V
C611	24212102	CD, 1000pF, ±10%
C612	24212102	CD, 1000pF, ±10%
C613	24212102	CD, 1000pF, ±10%
C616	24797100	EL, 10 $\mu$ F, ±20%, 50V
C617	24206010	EL, 1 $\mu$ F, 50V
C618	24797470	EL, 47 $\mu$ F, ±20%, 50V
C619	24590152	PF, 1500pF
C620	24797229	EL, 2.2 $\mu$ F, ±20%, 50V
C623	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C624	24232103	CD, 0.01 $\mu$ F, +80%, -20%
△C801	24082927	PF, 0.22 $\mu$ F, ±20%, AC275V
△C802	24094656	CD, 2200pF, ±20%, AC400V
△C803	24094656	CD, 2200pF, ±20%, AC400V
C804	24794470	EL, 47 $\mu$ F, ±20%, 16V
C807	24092281	CD, 4700pF, ±20%, AC250V
C808	24092281	CD, 4700pF, ±20%, AC250V
C809	24086871	EL, 120 $\mu$ F, ±20%, 400V
C812	24092341	CD, 470pF, ±10%, 2kV
C813	24095931	PF, 2200pF, 1250V
C814	24590223	PF, 0.022 $\mu$ F
C815	24590182	PF, 1800pF
C816	24666470	EL, 47 $\mu$ F, ±20%, 16V
C817	24676220	EL, 22 $\mu$ F, ±20%, 100V
C820	24794470	EL, 47 $\mu$ F, ±20%, 16V
C821	24797010	EL, 1 $\mu$ F, ±20%, 50V
C828	24212101	CD, 100pF, ±10%
C829	24795471	EL, 470 $\mu$ F, ±20%, 25V
C830	24092337	CD, 220pF, ±10%, 2kV
C831	24640932	EL, 100 $\mu$ F, ±20%, 160V
C835	24797479	EL, 4.7 $\mu$ F, ±20%, 50V
C836	24797100	EL, 10 $\mu$ F, ±20%, 50V
C837	24797100	EL, 10 $\mu$ F, ±20%, 50V
C838	24538474	PF, 0.47 $\mu$ F
C849	24214471	CD, 470pF, ±10%, 500V
C901	24700100	EL, 10 $\mu$ F, ±20%, 250V
C902	24095931	PF, 2200pF, 1250V
C903	24794100	EL, 10 $\mu$ F, ±20%, 16V
C904	24794220	EL, 22 $\mu$ F, ±20%, 16V
C931	24212331	CD, 330pF, ±10%
C932	24212331	CD, 330pF, ±10%
C933	24212331	CD, 330pF, ±10%
C934	24794471	EL, 470 $\mu$ F, ±20%, 16V
C936	24797479	EL, 4.7 $\mu$ F, ±20%, 50V
CA01	24474101	CD, 100pF, ±10%
CA14	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CA15	24794100	EL, 10 $\mu$ F, ±20%, 16V
CA16	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CA18	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CA19	24794470	EL, 47 $\mu$ F, ±20%, 16V
CA20	24474101	CD, 100pF, ±10%
CA21	24435470	CD, 47pF, 500V
CA22	24538104	PF, 0.1 $\mu$ F (1480TB/TBW)
CA24	24538104	PF, 0.1 $\mu$ F (1480TB/TBW)
CA37	24538104	PF, 0.1 $\mu$ F

Location No.	Part No.	Description
CA39	24474391	CD, 390pF, ±10%
CA40	24212221	CD, 220pF, ±10%
CA42	24538104	PF, 0.1 $\mu$ F
CA43	24538104	PF, 0.1 $\mu$ F
CA44	24794470	EL, 47 $\mu$ F, ±20%, 16V (1480TB/TBW)
CA45	24473560	CD, 56pF
CA46	24473560	CD, 56pF
CA47	24473390	CD, 39pF (1480RB/RBW)
CA48	24473390	CD, 39pF (1480RB/RBW)
CA49	24475222	CD, 2200pF
CA50	24797479	EL, 4.7 $\mu$ F, ±20%, 50V
CB01	24212472	CD, 4700pF, ±10%
CB02	24212561	CD, 560pF, ±10%
CB03	24763331	EL, 330 $\mu$ F, ±20%, 16V
CB04	24436181	CD, 180pF
CB05	24206010	EL, 1 $\mu$ F, 50V
CR01	24794100	EL, 10 $\mu$ F, ±20%, 16V
CR02	24797010	EL, 1 $\mu$ F, ±20%, 50V
CR03	24797010	EL, 1 $\mu$ F, ±20%, 50V
CR04	24797010	EL, 1 $\mu$ F, ±20%, 50V
CR05	24797010	EL, 1 $\mu$ F, ±20%, 50V
CR06	24797010	EL, 1 $\mu$ F, ±20%, 50V
CR07	24797010	EL, 1 $\mu$ F, ±20%, 50V
CR08	24473270	CD, 27pF
CV01	24794101	EL, 100 $\mu$ F, ±20%, 16V
CV02	24793471	EL, 470 $\mu$ F, ±20%, 10V
<b>RESISTORS</b>		
R002	24366102	CF, 1k ohm
R101	24366101	CF, 100 ohm
R103	24366103	CF, 10k ohm
R105	24366101	CF, 100 ohm
R106	24366153	CF, 15k ohm
R109	24366563	CF, 56k ohm
R135	24366682	CF, 6800 ohm
R136	24366122	CF, 1200 ohm
R137	24366681	CF, 680 ohm
R138	24366360	CF, 36 ohm
R174	24366392	CF, 3900 ohm
R175	24366471	CF, 470 ohm
R179	24366201	CF, 200 ohm
R180	24366331	CF, 330 ohm
R181	24366221	CF, 220 ohm
R182	24366820	CF, 82 ohm
R185	24366101	CF, 100 ohm
R186	24366391	CF, 390 ohm
R187	24366223	CF, 22k ohm
R188	24366223	CF, 22k ohm
R189	24366102	CF, 1k ohm
R191	24942226	CC, 22M ohm, 1/2W
R201	24366222	CF, 2200 ohm
R204	24366751	CF, 750 ohm (1480TB/TBW)
R205	24366303	CF, 30k ohm
R206	24366271	CF, 270 ohm
R207	24366271	CF, 270 ohm
R208	24366271	CF, 270 ohm
R209	24366223	CF, 22k ohm
R210	24366101	CF, 100 ohm
R211	24366101	CF, 100 ohm
R212	24552221	OMF, 220 ohm, 1/2W
R213	24366103	CF, 10k ohm
R214	24366472	CF, 4700 ohm
R215	24366561	CF, 560 ohm

**SPECIFIC INFORMATIONS**

Location No.	Part No.	Description
R216	24366102	CF, 1k ohm
R217	24366101	CF, 100 ohm
R218	24366824	CF, 820k ohm
R219	24366151	CF, 150 ohm
R220	24366102	CF, 1k ohm (1480TB/TBW)
R221	24366104	CF, 100k ohm
R222	24366472	CF, 4700 ohm
R223	24366222	CF, 2200 ohm
R224	24366123	CF, 12k ohm
R225	24366102	CF, 1k ohm (1480TB/TBW)
R240	24366682	CF, 6800 ohm
R241	24366223	CF, 22k ohm
R244	24366152	CF, 1500 ohm
R316	24366102	CF, 1k ohm
R317	24366563	CF, 56k ohm
R318	24366433	CF, 43k ohm
R319	24552132	OMF, 1300 ohm, 1/2W
R320	24383271	OMF, 270 ohm, 2W
R321	24366393	CF, 39k ohm
R322	24366224	CF, 220k ohm
R323	24322229	OMF, 2.2 ohm, 1W
R325	24366203	CF, 20k ohm
△R327	24339479	MF, 4.7 ohm, 2W
R330	24321109	MF, 1 ohm, 1/2W
R333	24366222	CF, 2200 ohm
R360	24366622	CF, 6200 ohm (1480TB/TBW)
R410	24552472	OMF, 4700 ohm, 1/2W
R411	24366561	CF, 560 ohm
R412	24322129	MF, 1.2 ohm, 1W
R413	24382471	OMF, 470 ohm, 1W
R414	24366181	CF, 180 ohm
R416	24510182	Cement, 1800 ohm, 5W
R440	24366103	CF, 10k ohm
△R444	24338398	MF, 0.39 ohm, 1W
R445	24552331	OMF, 330 ohm, 1/2W
R446	24383331	OMF, 330 ohm, 2W
△R448	24338338	MF, 0.33 ohm, 1W
R470	24338828	MF, 0.82 ohm, 1W
R471	24552101	OMF, 100 ohm, 1/2W
R472	24376393	CF, 39k ohm, 1/2W
R474	24366331	CF, 330 ohm
R475	24366102	CF, 1k ohm
R477	24366203	CF, 20k ohm
R517	24366103	CF, 10k ohm
R580	24366103	CF, 10k ohm
R601	24366339	CF, 3.3 ohm
R602	24366123	CF, 12k ohm
R603	24366182	CF, 1800 ohm
R604	24366103	CF, 10k ohm
R605	24552331	OMF, 330 ohm, 1/2W
R607	24366103	CF, 10k ohm
R610	24366332	CF, 3300 ohm
R614	24366562	CF, 5600 ohm
R615	24366562	CF, 5600 ohm
R616	24366562	CF, 5600 ohm
R618	24366474	CF, 470k ohm
R623	24366682	CF, 6800 ohm
R624	24366681	CF, 680 ohm
R625	24366104	CF, 100k ohm
R626	24366103	CF, 10k ohm
R628	24366104	CF, 100k ohm
R629	24366153	CF, 15k ohm
R630	24366392	CF, 3900 ohm
△R801	24009954	Metal-Glazed Resistor, 2.2M ohm, 1/2W

Location No.	Part No.	Description
R803	24366824	CF, 820k ohm
R804	24366561	CF, 560 ohm
R805	24377394	CF, 390k ohm, 1W
R806	24383470	OMF, 47 ohm, 2W
R807	24383330	OMF, 33 ohm, 2W
R808	24531100	FR, 10 ohm, 1/2W
R809	24366561	CF, 560 ohm
R810	24366561	CF, 560 ohm
R811	24322398	MF, 0.39 ohm, 1W
R812	24366470	CF, 47 ohm
R813	24366561	CF, 560 ohm
R814	24366102	CF, 1k ohm
R815	24366561	CF, 560 ohm
R816	24366103	CF, 10k ohm
R817	24366102	CF, 1k ohm
R818	24366102	CF, 1k ohm
R819	24321689	OMF, 6.8 ohm, 1/2W
R820	24366561	CF, 560 ohm
R825	24366472	CF, 4700 ohm
R828	24366339	CF, 3.3 ohm
R842	24366681	CF, 680 ohm
R843	24366821	CF, 820 ohm
△R844	24005007	Metal-Glazed Resistor, 8.2M ohm, 1W
R848	24366392	CF, 3900 ohm
R860	24366122	CF, 1200 ohm
R865	24366681	CF, 680 ohm
R866	24366471	CF, 470 ohm
R867	24366103	CF, 10k ohm
R868	24366472	CF, 4700 ohm
R870	24383822	OMF, 8200 ohm, 2W
R871	24366472	CF, 4700 ohm
R872	24510479	Cement, 4.7 ohm, 5W
R878	24531270	FR, 27 ohm, 1/2W
R879	24366472	CF, 4700 ohm
R884	24531120	FR, 12 ohm, 1/2W
△R890	24019419	PTC Thermistor, 18 ohm
R893	24366103	CF, 10k ohm
R901	24552272	OMF, 2700 ohm, 1/2W
R902	24552272	OMF, 2700 ohm, 1/2W
R903	24552272	OMF, 2700 ohm, 1/2W
R904	24366102	CF, 1k ohm
R905	24366229	CF, 2.2 ohm
△R920	24000884	FR, 3 ohm, 1W
R928	24366101	CF, 100 ohm
R930	24366681	CF, 680 ohm
R931	24366102	CF, 1k ohm
R932	24366361	CF, 360 ohm
R933	24366681	CF, 680 ohm
R934	24366681	CF, 680 ohm
R935	24366681	CF, 680 ohm
R936	24366471	CF, 470 ohm
R937	24366471	CF, 470 ohm
R938	24366471	CF, 470 ohm
R947	24552820	OMF, 82 ohm, 1/2W
R948	24366101	CF, 100 ohm
R961	24366270	CF, 27 ohm
R962	24366270	CF, 27 ohm
R963	24366270	CF, 27 ohm
R966	24366101	CF, 100 ohm
R967	24366101	CF, 100 ohm
R991	24382183	OMF, 18k ohm, 1W
R992	24382183	OMF, 18k ohm, 1W
R993	24382183	OMF, 18k ohm, 1W

## SPECIFIC INFORMATIONS

Location No.	Part No.	Description
RA01	24366103	CF, 10k ohm
RA02	24366472	CF, 4700 ohm
RA03	24366103	CF, 10k ohm
RA05	24366103	CF, 10k ohm
RA06	24366103	CF, 10k ohm
RA07	24366472	CF, 4700 ohm
RA09	24019001	MF, 100k ohm, ±1%, 1/4W
RA10	24366102	CF, 1k ohm (1480TB/TBW)
RA11	24366182	CF, 1800 ohm (1480TB/TBW)
RA12	24366103	CF, 10k ohm
RA14	24366103	CF, 10k ohm
RA15	24366331	CF, 330 ohm
RA16	24366331	CF, 330 ohm
RA24	24366225	CF, 2.2M ohm
RA25	24366333	CF, 33k ohm
RA27	24366333	CF, 33k ohm
RA28	24000242	MF, 18k ohm, ±1%, 1/4W
RA33	24366391	CF, 390 ohm
RA34	24000245	MF, 33k ohm, ±1%, 1/4W
RA35	24366223	CF, 22k ohm
RA37	24366273	CF, 27k ohm (1480TB/TBW)
RA40	24366102	CF, 1k ohm (1480TB/TBW)
RA41	24366103	CF, 10k ohm
RA42	24366103	CF, 10k ohm
RA45	24366103	CF, 10k ohm
RA49	24366103	CF, 10k ohm
RA54	24366472	CF, 4700 ohm
RA57	24366103	CF, 10k ohm
RA58	24366222	CF, 2200 ohm
RA60	24366331	CF, 330 ohm
RA61	24366103	CF, 10k ohm
RA62	24366223	CF, 22k ohm
RA64	24366103	CF, 10k ohm
RA65	24366103	CF, 10k ohm
RA70	24366332	CF, 3300 ohm
RA71	24366682	CF, 6800 ohm
RA72	24366203	CF, 20k ohm
RA76	24366103	CF, 10k ohm
RA78	24366102	CF, 1k ohm
RA81	24366471	CF, 470 ohm
RA86	24366103	CF, 10k ohm
RA88	24366103	CF, 10k ohm
RA90	24366103	CF, 10k ohm
RA91	24366102	CF, 1k ohm
RA96	24366123	CF, 12k ohm
RA97	24366152	CF, 1500 ohm
RB01	24366223	CF, 22k ohm
RB02	24366392	CF, 3900 ohm
RB03	24366392	CF, 3900 ohm
RB04	24366123	CF, 12k ohm
RB05	24366333	CF, 33k ohm
RB06	24366564	CF, 560k ohm
RB07	24366182	CF, 1800 ohm
RB08	24366471	CF, 470 ohm
RE01	24366391	CF, 390 ohm
RR01	24366472	CF, 4700 ohm
RR02	24366472	CF, 4700 ohm
RR03	24366103	CF, 10k ohm
RR04	24366333	CF, 33k ohm
RR05	24366103	CF, 10k ohm
RR06	24366102	CF, 1k ohm
RR16	24366331	CF, 330 ohm
RR17	24366331	CF, 330 ohm
RR18	24366331	CF, 330 ohm

Location No.	Part No.	Description
RV01	24552101	OMF, 100 ohm, 1/2W
RV02	24552101	OMF, 100 ohm, 1/2W
RV04	24366680	CF, 68 ohm
RV05	24366103	CF, 10k ohm
RV08	24366750	CF, 75 ohm
RV09	24366101	CF, 100 ohm
RV10	24366750	CF, 75 ohm
RV11	24366101	CF, 100 ohm
RV12	24366750	CF, 75 ohm
RV13	24366101	CF, 100 ohm
RV14	24366750	CF, 75 ohm
RV15	24366750	CF, 75 ohm
RV26	24366391	CF, 390 ohm
RV27	24366391	CF, 390 ohm
RV28	24366391	CF, 390 ohm
<b>COILS &amp; TRANSFORMERS</b>		
L101	23238558	Coil, Peaking, TRF4R47AJ
L102	23221803	Coil, Choke, TLN3040D
L105	23261985	Coil, RF Choke, TRF9221
L107	23238713	Coil, Peaking, TRF4120AJ
L161	23262813	Coil, IF, TRF1077D
L202	23289100	Coil, Peaking, TRF4100AF
L204	23289100	Coil, Peaking, TRF4100AF
L205	23289680	Coil, Peaking, TRF4680AF
L311	23103859	Coil (Ferrite Bead), TEM2011
L405	23221739	Coil, Choke, TRF9252D
L408	23221722	Coil, Choke, TLN3142D
L410	23289100	Coil, Peaking, TRF4100AF
L811	23103859	Coil (Ferrite Bead), TEM2011
L821	23280016	Coil, Peaking, TRF4100AZ
L823	23103859	Coil (Ferrite Bead), TEM2011
L826	23280016	Coil, Peaking, TRF4100AZ
L829	23103859	Coil (Ferrite Bead), TEM2011
L866	23289229	Coil, Peaking, TRF42R2AF
△L901	23200691	Coil, Degaussing, TSB-2229AT
L990	23289100	Coil, Peaking, TRF4100AF
LA02	23289109	Coil, Peaking, TRF41R0AF
LA03	23103859	Coil (Ferrite Bead), TEM2011
LA04	23103859	Coil (Ferrite Bead), TEM2011 (1480TB/TBW)
LA05	23103859	Coil (Ferrite Bead), TEM2011 (1480TB/TBW)
LA06	23238708	Coil, Peaking, TRF4330AJ (1480RB/RBW)
△T401	23224983	Transformer, Horiz. Drive, TLN1039
△T461	23236501	Transformer, Flyback, TFB4124AE
△T801	23211929	Line Filter, TRF3130
△T803	23217274	Transformer, Converter, TPW3322AR
<b>SEMICONDUCTORS</b>		
Q105	A6708871	Transistor, 2SC388ATM
Q110	A6317440	Transistor, 2SC1815-Y
Q111	A6317440	Transistor, 2SC1815-Y
Q112	A6534053	Transistor, 2SA1015-Y(TE)
Q201	A6317440	Transistor, 2SC1815-Y
Q210	23114530	Transistor, 2SA933S-Q
Q212	A6317440	Transistor, 2SC1815-Y (1480TB/TBW)
Q301	B0377890	IC, TA8403K

Location No.	Part No.	Description
Q301B	23037310	Screw, BTBW3X10 SZN
Q302	A6317440	Transistor, 2SC1815-Y (1480TB/TBW)
Q402	A6330069	Transistor, 2SC2482 FA-1
Q404	A6871242	Transistor, 2SD1554
Q404B	23037310	Screw, BTBW3X10 SZN
Q470	A6547250	Transistor, 2SA1320
Q480	23314141	Transistor, 2SC3852
Q480B	23035308	Screw, BTB3X8SZN
Q501	B0101539	IC, TB1231N(FA-1)
Q601	23119668	IC, TDA2611A
Q602	23318916	IC, MC14053BCP
Q603	A6342206	Transistor, 2SC2878-A(TE)
Q604	A6534053	Transistor, 2SA1015-Y(TE)
Q606	A6010040	Transistor, RN2004
Q608	A6317440	Transistor, 2SC1815-Y
Q609	A6342206	Transistor, 2SC2878-A(TE)
Q801	23314146	IC(STR), STR58041
Q802	A6534145	Transistor, 2SA1020-Y(C)
Q803	A6333346	Transistor, 2SC2655-Y(C)
Q804	A6317440	Transistor, 2SC1815-Y
Q805	A6317440	Transistor, 2SC1815-Y
Q806	A6317440	Transistor, 2SC1815-Y
△ Q826	A8643108	Photo Coupler, TLP621(GR-LF)
Q828	A6317440	Transistor, 2SC1815-Y
Q831	A6317440	Transistor, 2SC1815-Y
Q835	23318299	IC, L78MR05
Q836	A6534053	Transistor, 2SA1015-Y(TE)
Q861	23314141	Transistor, 2SC3852
Q861B	70391356	Screw, BITTB3X10 SZN
Q870	A6333346	Transistor, 2SC2655-Y(C)
Q871	A6317440	Transistor, 2SC1815-Y
Q905	A6330069	Transistor, 2SC2482 FA-1
Q907	A6330069	Transistor, 2SC2482 FA-1
Q909	A6330069	Transistor, 2SC2482 FA-1
Q910	A6330069	Transistor, 2SC2482 FA-1
Q911	23114530	Transistor, 2SA933S-Q
QA01	23906524	IC, SAA290ZP/084/M5 (1480TB/TBW)
QA02	23904706	IC, NM24C02EN
QA03	A6317440	Transistor, 2SC1815-Y
QA04	A6317440	Transistor, 2SC1815-Y
QA08	A6317440	Transistor, 2SC1815-Y
QA09	A6317440	Transistor, 2SC1815-Y
QA10	A6317440	Transistor, 2SC1815-Y
QA25	A6317440	Transistor, 2SC1815-Y
QB01	A6317440	Transistor, 2SC1815-Y
QB02	A6534053	Transistor, 2SA1015-Y(TE)
QR01	70129053	IC, BA7603
QR02	A6002040	Transistor, RN1204
QR03	A6734590	Transistor, 2SC752(G)TM-Y
QR05	A6317440	Transistor, 2SC1815-Y
QR07	A6002040	Transistor, RN1204
QV01	A6317440	Transistor, 2SC1815-Y
D108	23115878	Diode, Zener, $\mu$ PC574J, (L)
D109	23115599	Diode, 1N4148
D111	23115599	Diode, 1N4148
D201	A7150258	Diode, 1SS176
D202	23316667	Diode, Zener, MTZJ4.7C
D206	23115599	Diode, 1N4148
D208	23115599	Diode, 1N4148
D301	23118479	Diode, BYD33J
D302	23118479	Diode, BYD33J
D312	23316794	Diode, SC570A

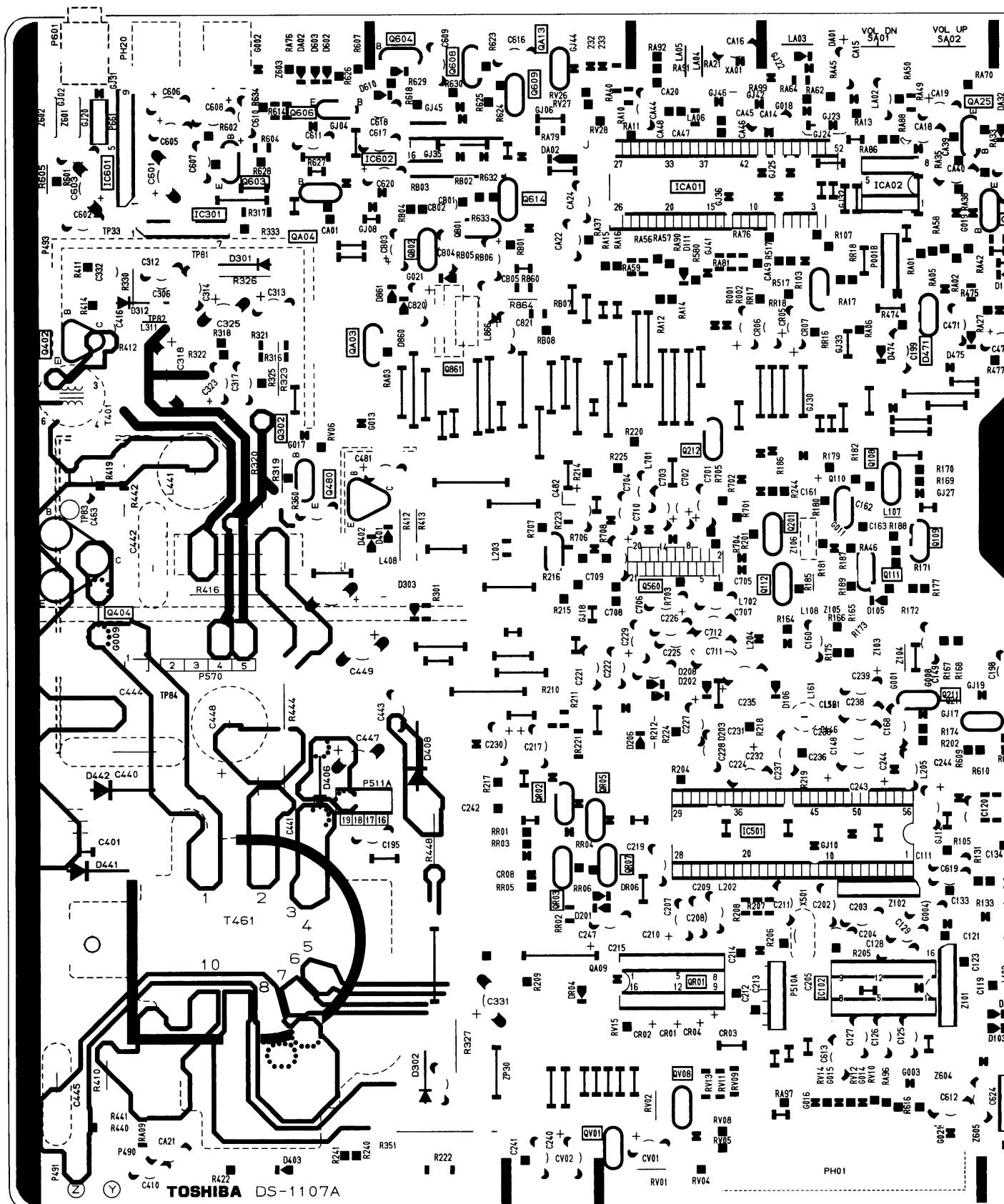
Location No.	Part No.	Description
D401	23316668	Diode, Zener, MTZJ5.1A
D402	23316666	Diode, Zener, MTZJ4.7B
D403	23316688	Diode, Zener, MTZJ9.1C
D406	23118479	Diode, BYD33J
D408	23118052	Diode, RU4Z
D471	A7801205	SCR, SF0R3G42
D474	23316728	Diode, Zener, MTZJ16B
D475	23316719	Diode, Zener, MTZJ12B
D601	23115599	Diode, 1N4148
D602	23115599	Diode, 1N4148
D603	23115599	Diode, 1N4148
D610	23115599	Diode, 1N4148
D801	23118124	Diode, LB-156 (LF-B)
D810	23316725	Diode, Zener, MTZJ15B
D811	23115599	Diode, 1N4148
D812	23118479	Diode, BYD33J
D813	23115599	Diode, 1N4148
D814	23316672	Diode, Zener, MTZJ5.6B
D815	23115599	Diode, 1N4148
D816	23316648	Diode, Zener, MTZJ2.2A
D817	23118479	Diode, BYD33J
D818	23118479	Diode, BYD33J
D819	23316675	Diode, Zener, MTZJ6.2B
D830	23118479	Diode, BYD33J
D832	23118479	Diode, BYD33J
D847	23115599	Diode, 1N4148
D848	23316666	Diode, Zener, MTZJ4.7B
D860	23316674	Diode, Zener, MTZJ6.2A
D861	23316672	Diode, Zener, MTZJ5.6B
D870	23115599	Diode, 1N4148
D878	23316689	Diode, Zener, MTZJ10A
D991	23316554	Diode, 1SS146
D992	23316554	Diode, 1SS146
D993	23316554	Diode, 1SS146
D994	23115599	Diode, 1N4148
DA01	23316675	Diode, Zener, MTZJ6.2B
DA02	23115599	Diode, 1N4148
DA03	23115599	Diode, 1N4148
DA32	23115599	Diode, 1N4148
DE50	23358504	LED, Red, SCL003URC3FX
DR04	23115599	Diode, 1N4148
DR06	23115599	Diode, 1N4148

**MISCELLANEOUS**

B202	23451654	Holder, FBT
△ F801	23144507	Fuse, 3.15A
F801A	23165433	Holder, Fuse
△ F803	23144876	Fuse, 0.5A
F803A	23165433	Holder, Fuse
G002	24366681	CF, 680 ohm
G003	24366681	CF, 680 ohm
G012	23115599	Diode, 1N4148
G013	23115599	Diode, 1N4148
G017	24366473	CF, 47k ohm (1480TB/TBW)
G019	24366102	CF, 1k ohm
G021	23289109	Coil, Peaking, TRF41R0AF
K901	23904750	IR Receiver
P601	23365292	Jack, Earphone
△ P801	23372012	Power Cord
P803	23164725	Plug, 2P
PH01	23365598	Connector, 21Pin
PH20	23364692	Jack Phono, 2P
△ S801	23145434	Switch, Power, 2C2P
SA01	23145430	Switch, Push, 1C1P

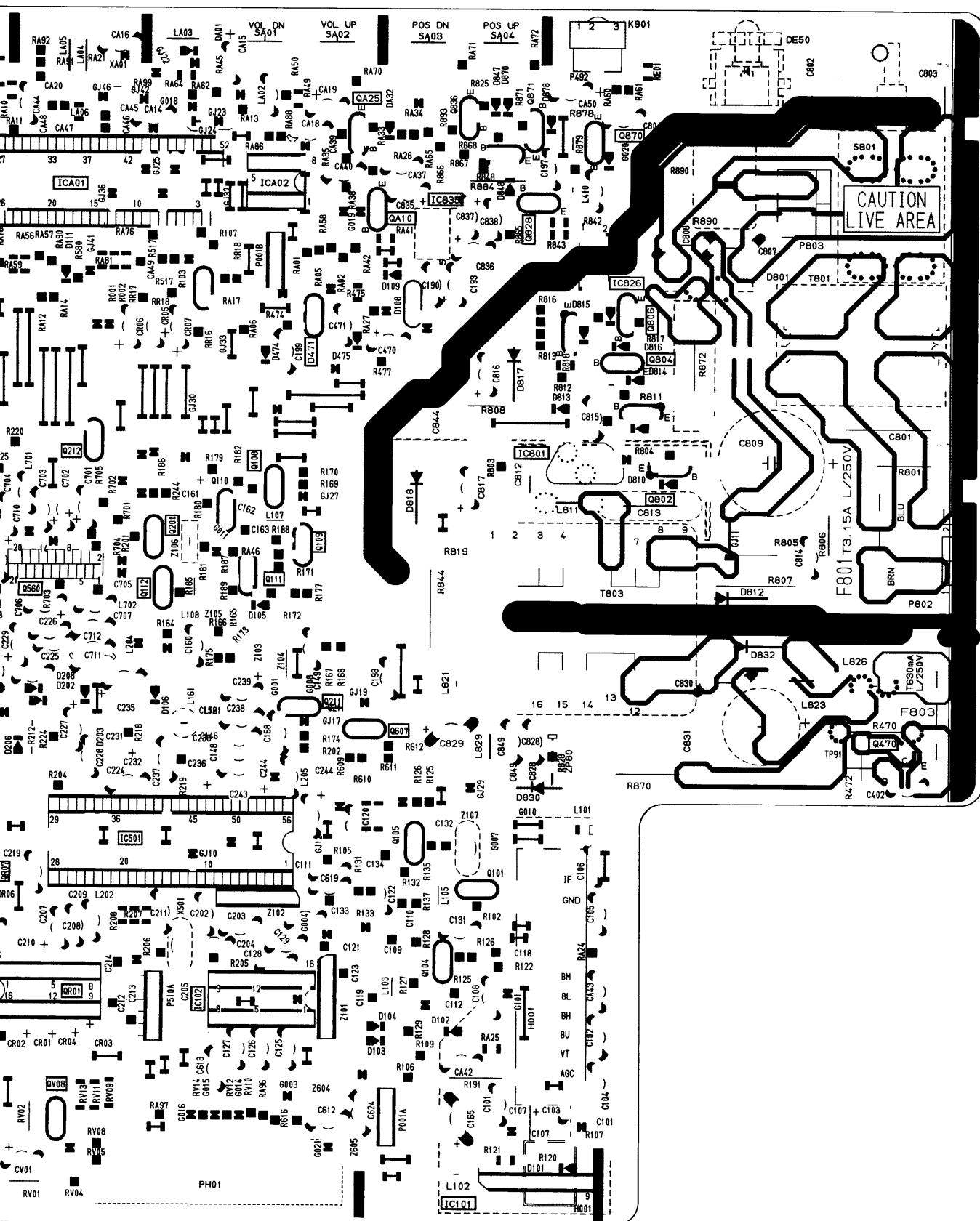
Location No.	Part No.	Description	Location No.	Part No.	Description
SA02	23145430	Switch, Push, 1C1P	A201	23410259	Front Cover (1480TB)
SA03	23145430	Switch, Push, 1C1P	A201	23410765	Front Cover (1480TBW)
SA04	23145430	Switch, Push, 1C1P	A201	23410303	Front Cover (1480RB)
△V901A	23902022	Socket, CRT, 8P	A201	23410763	Front Cover (1480RBW)
W661	23351079	Speaker, SPK-1351, 77x77mm, 16 ohm	A218	23421601	Rail, L
X501	23153979	Crystal, 4.43MHz	A231	23443832	Button, Power (1480TB)
XA01	23153930	Crystal, 12.0MHz	△A401	23425821	Back Cover (1480TB/RB)
Z102	23303135	Filter, 39.5M, OFWJ1951M	△A401	23426722	Back Cover (1480TBW/RBW)
Z104	23107948	Ceramic Filter, 6.0MHz, SFE6.0MBF	A411	23560988	Label, Model No. (1480TB/TBW)
Z105	23107926	Ceramic Video Trap, 6.0MHz, TCF1012	A411	23560989	Label, Model No. (1480RB/RBW)
Z601	23107744	Filter, TEM1012	A501	23030187	Screw, CRT5X30
Z602	23107744	Filter, TEM1012	A701	23525589	Case
zp30	23144599	Protector, 125V, 0.63A	A702	23935266	Packing, Bottom
zp80	23144539	Protector, 125V, 2A	A703	23935267	Packing, Top
ZT01	23153736	Ceramic Resonator, TCR1025			
<b>PC BOARD ASSEMBLIES</b>					
* U902A	23781699	Signal Board, PB7978A-1 (1480TB/1480TBW)			
* U902A	23781699	Signal Board, PB7978G-1 (1480RB/1480RBW)			
* U902B	23781701	CRT Drive Board, PB7978A-2 (1480TB/1480TBW)			
* U902B	23781701	CRT Drive Board, PB798G-2 (1480RB/1480RBW)			
<b>PICTURE TUBE</b>					
△V901	23312582	Picture Tube, A34EAC01X65			
<b>TUNER</b>					
H001	23321205	Tuner, UF813BX1			
<b>ACCESSORIES</b>					
K902	23306084	Remote Hand Unit, CT-9784 (1480TB/TBW)			
AT03	23305743	Battery Cover			
Y101	23563313	Owner's Manual, English, 1480TB/1480TBW			
Y101	23563314	Owner's Manual, English, 1480RB/1480RBW			
Y125	23323039	Loop Aerial			

**MAIN BOARD PB7978A-1**  
BOTTOM (FOIL) SIDE

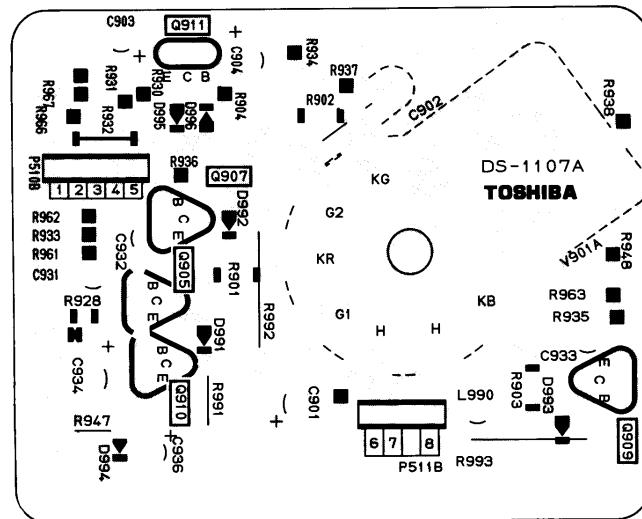


# MAIN BOARD PB7978A-1

BOTTOM (FOIL) SIDE

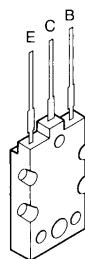


**CRT/D BOARD PB7978A-2**  
BOTTOM (FOIL) SIDE

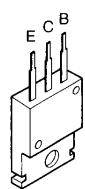


## TERMINAL VIEW OF TRANSISTORS

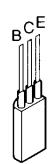
① 2SD2253  
(old)  
2SC5243



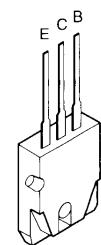
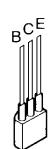
② 2SC3852  
2SD1763A  
2SC1569  
2SC4544  
2SA1788  
2SA1306  
2SA1186A



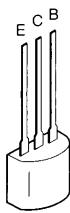
③ 2SC752GTM  
2SC2482  
2SC2655  
2SC4721P



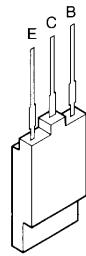
④ 2SC752  
2SA562TM  
2SA1015  
2SC1815  
2SC2878  
2SC1740S  
2SC2120  
2SA9335



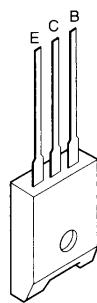
⑥ RN2203  
RN2201  
RN2004  
RN1203  
RN1204  
RN2204  
RN1205  
RN1202  
RN1201



⑦ 2SD1554  
2SD2253  
2SD1556  
2SC5143



⑧ ON4409



#### **SPECIFICATIONS (Representative : 1480TB)**

Input Power Rating:	53 watts(Approx), AC 220~240 volts, 50 Hz
Aerial Input Impedance:	75 ohm unbalanced type for UHF
Receiving Channels:	PAL-I Standard: UHF ..... channels 21 to 69
Intermediate Frequencies:	Picture I-F carrier frequency ..... 39.5 MHz Sound I-F carrier frequency ..... 33.5 MHz Colour sub-carrier frequency ..... 35.07 MHz
Picture Tube	14 inches, 340 mm (measured on diagonal of viewable picture area), 90° deflection
Sound Output:	1.5 watts (at 10% harmonic distortion) x 1
Speakers:	77mm round 1 pc
Dimensions:	Height ..... 366 mm Width ..... 400 mm Depth ..... 378 mm
Mass:	9.2 kg

Specifications are subject to change without notice.

**TOSHIBA CORPORATION**

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-01, JAPAN

## EXPRESSION

## VALUE OF RESISTOR CAPACITOR AND INDUCTOR

1. Resistance value of a principal transformer is shown in this schematic diagram. There are numbered points from the circuit. Other values noted on schematic, all capacitor values less than 1 are expressed in  $\mu F$ , and the value greater than 1 are expressed in  $\mu H$ .
2. Capacitor values less than 1 are expressed in  $\mu F$ , and the values less than 1 in  $\mu H$ .
3.  $\oplus$  : Solder link.

1-28017-14589-12  
P-2033

## OBSERVATION OF VOLTAGE AND WAVEFORMS

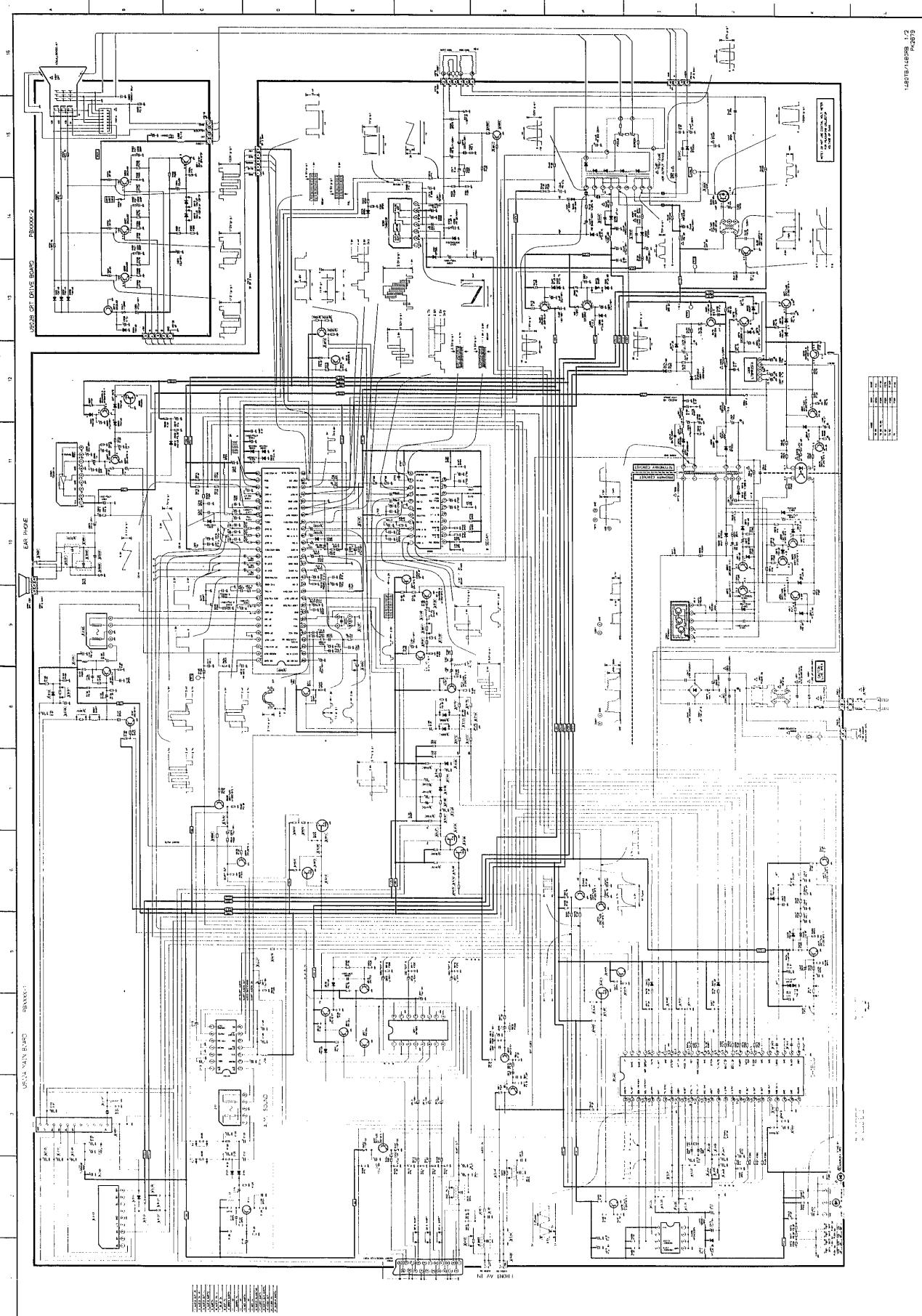
1. Voltage read with VOM from point shown in circuit, ground, line voltage 220V, will differ by the split voltage reading may be 20%.
2. All waveforms are taken using a wide band oscilloscope and low capacity probe.
3. Make sure the CONTROL and COOL CONTROL are in end position and BRIGHTNESS control is almost in maximum position. Set other controls for best picture.

## SCHEMATIC DIAGRAM MODEL : 1480TB / 1480TBW (1/2)

1480RB / 1480RBW

030 - 9 - 8 - 03

CAUTION: The information contained on this schematic diagram and the parts list is for design purposes only. It is not to be used for repair or modification of the original circuit or specified identical components which have been specially designed for safety and should be replaced only with parts listed in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 3.



# SCHEMATIC DIAGRAM

**MODEL : 1480TB / 1480TBW (1/2)**

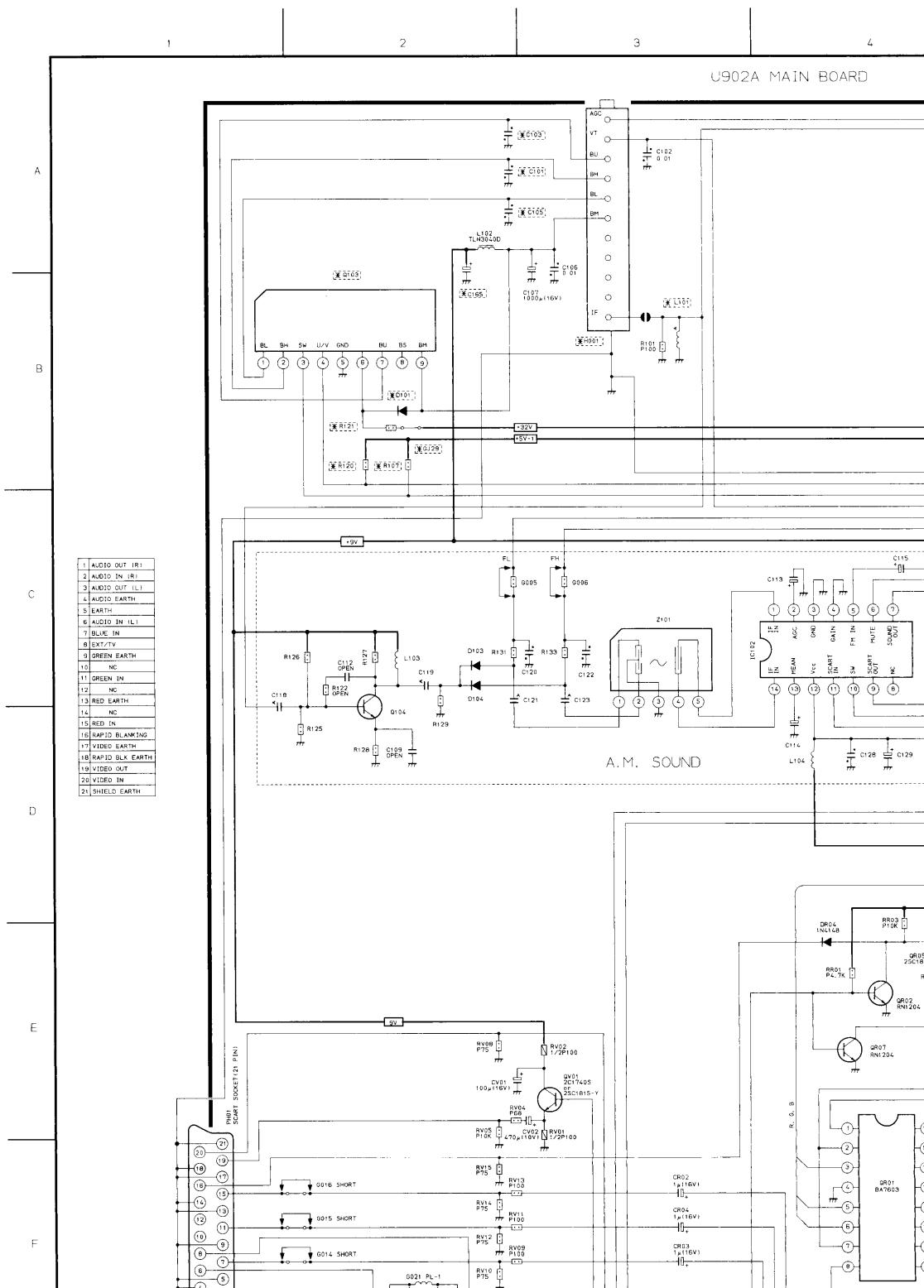
0 3 0 - 9 8 0 3

**1480RB / 1480RBW**

**CAUTION:** The international hazard symbols “” in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 3. Do not degrade the safety of the receiver through improper servicing.

**OBSERVATION**

1. Voltages re...  
volts, colour
2. All waveform
3. Waveform
4. Make sure  
BRIGHTNE...  
picture.



(1/2)

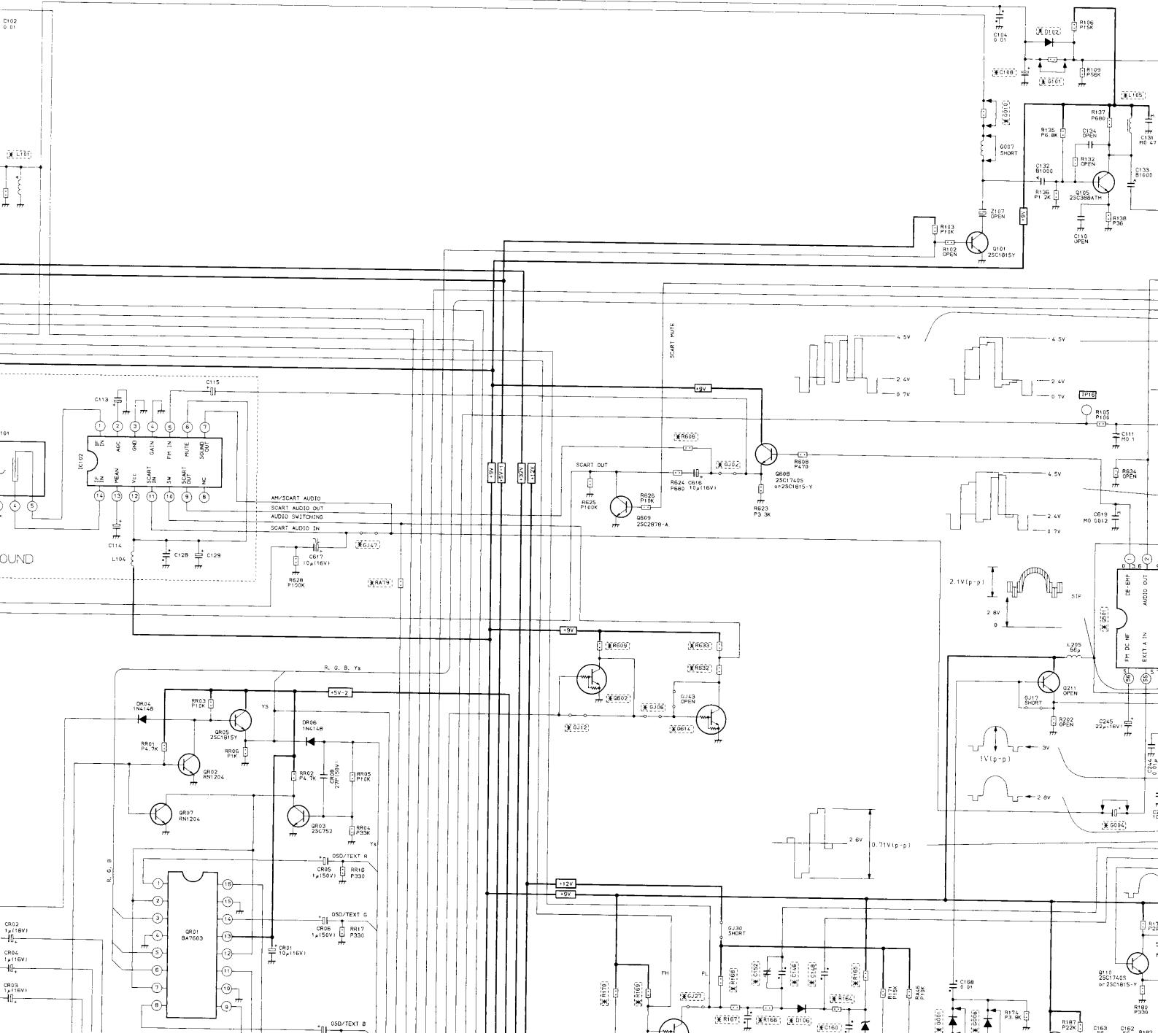
## OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltages read with VTVM from point shown to chassis ground, line voltage 220 volts, colour bar signal. Voltages reading may vary  $\pm 20\%$ .
2. All waveforms are taken using a wide band oscilloscope and a low capacity probe.
3. Waveforms are taken using a standard colour bar signal.
4. Make sure that CONTRAST and COLOUR controls are in mid position and BRIGHTNESS control is almost in maximum position. Set other controls for best picture.

**NOTES:**

1. D.C. resistance value of  
gram. These are measured
2. The circuits are subject to  
variations.
3.  : Solder links.

U902A MAIN BOARD

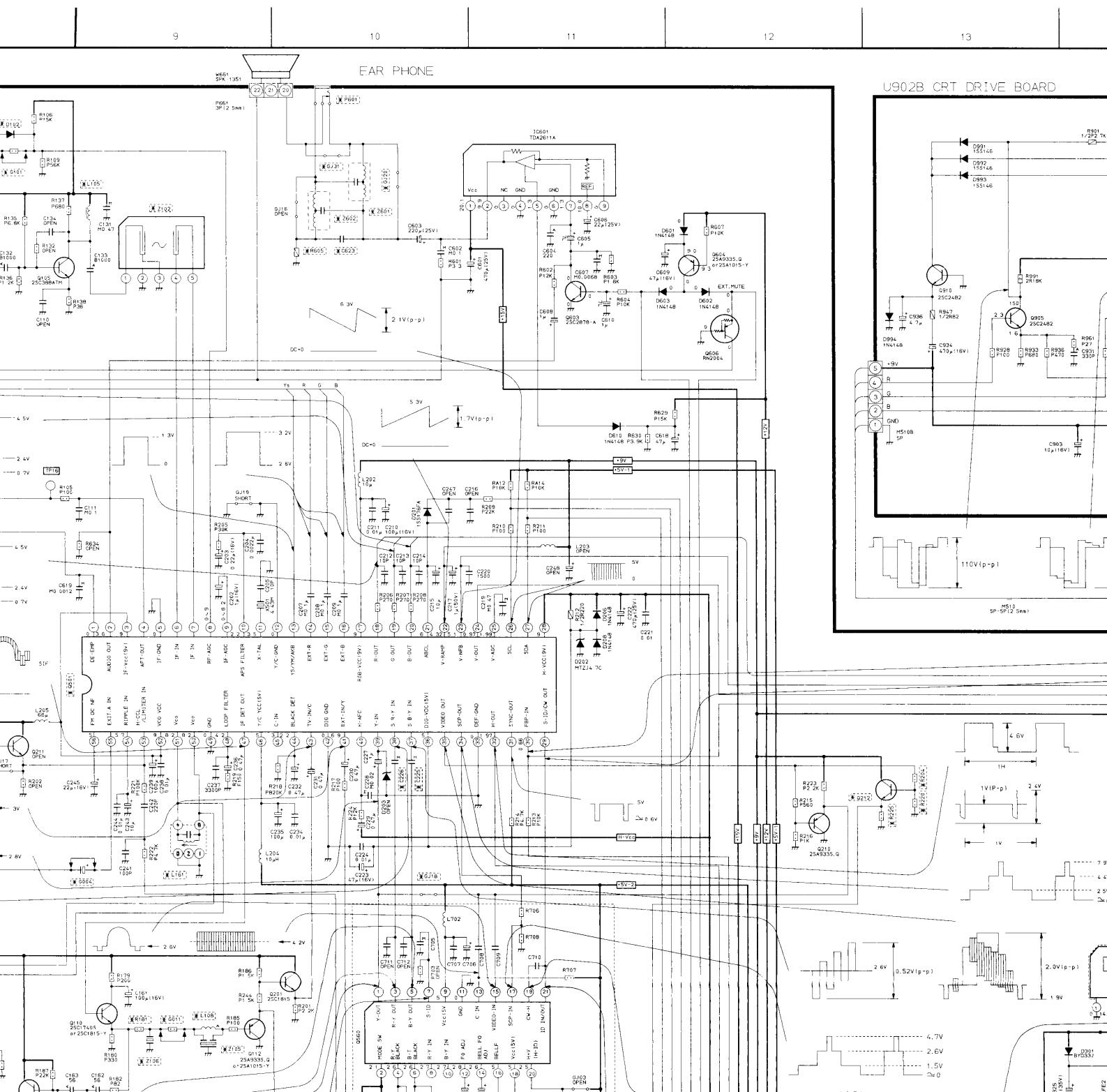


# EXPRESSION

## VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistance is shown in ohm,  $k=1,000$ ,  $M=1,000,000$
2. Unless otherwise noted in schematic, all capacitor values are in  $\mu F$  and the values more than 1 in  $pF$ .
3. Unless otherwise noted in schematic, all inductor values are in  $\mu H$ , and the values less than 1 in  $H$ .

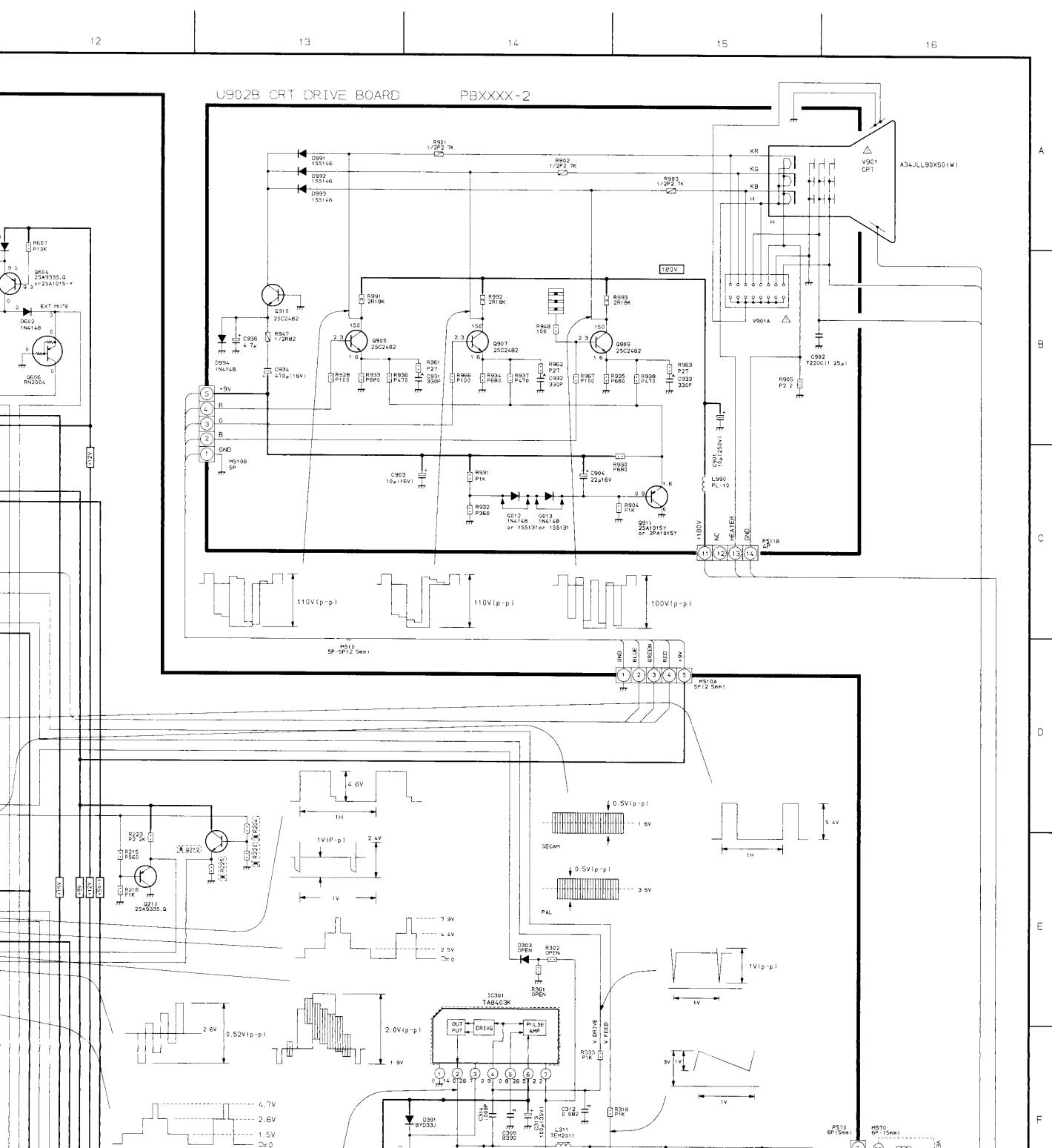
istance value of a principal transformer is shown in this schematic dia-  
these are measured for separated from the circuit.  
uits are subject to change without notice.  
older links.

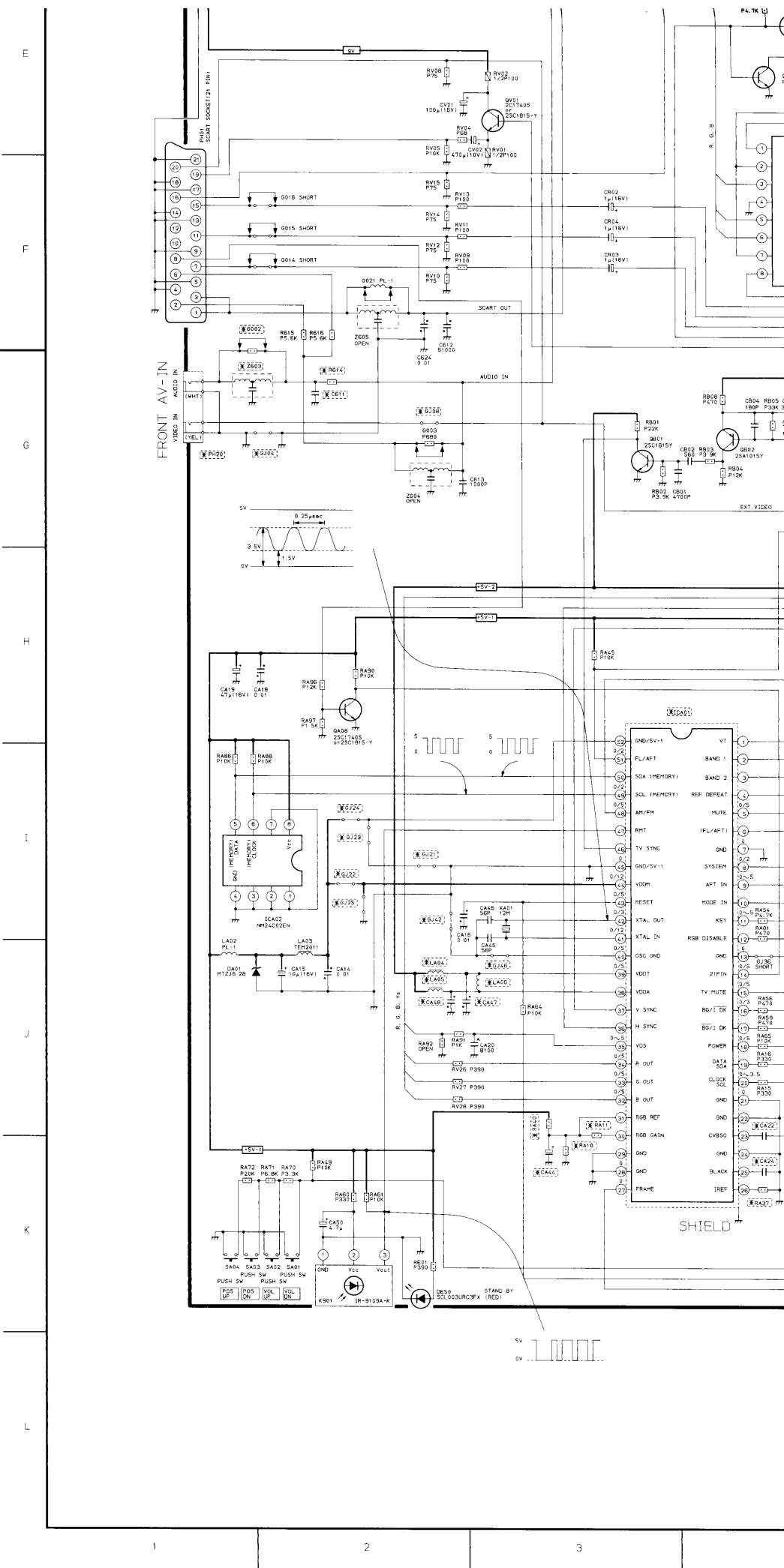


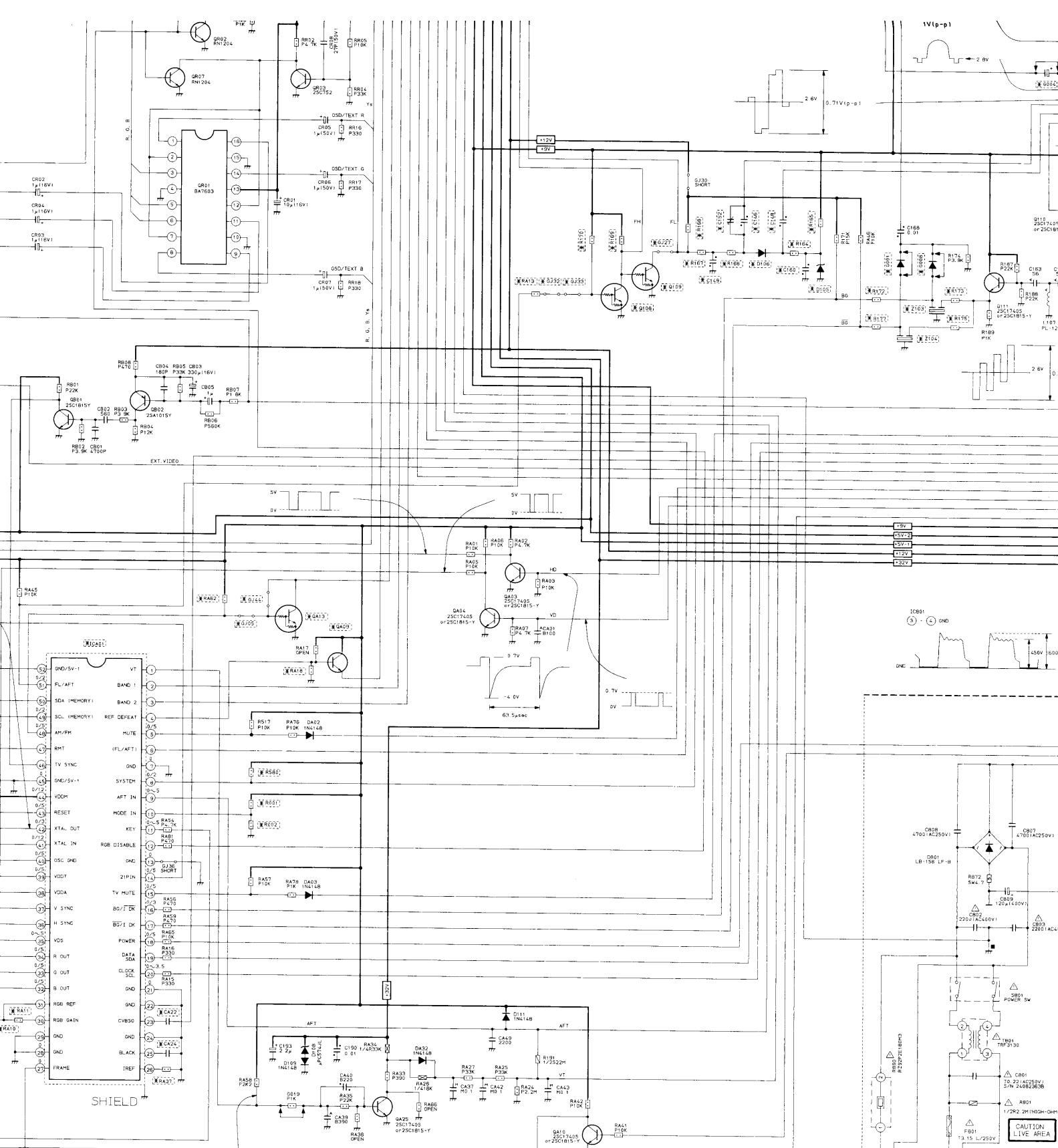
## EXPRESSION

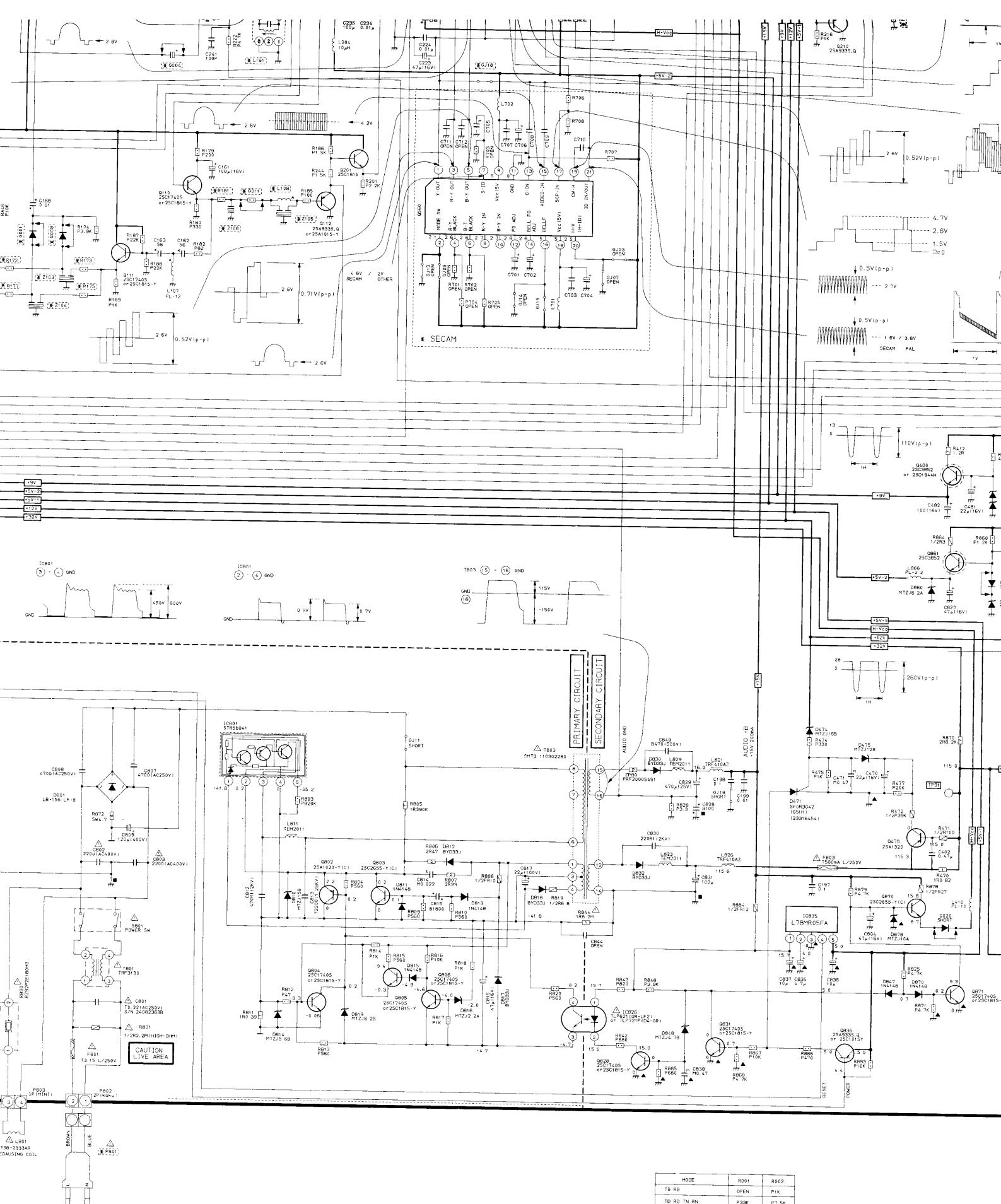
### VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistance is shown in ohm, k=1,000, M=1,000,000
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in  $\mu\text{F}$  and the values more than 1 in  $\text{pF}$ .
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in  $\mu\text{H}$ , and the values less than 1 in H.

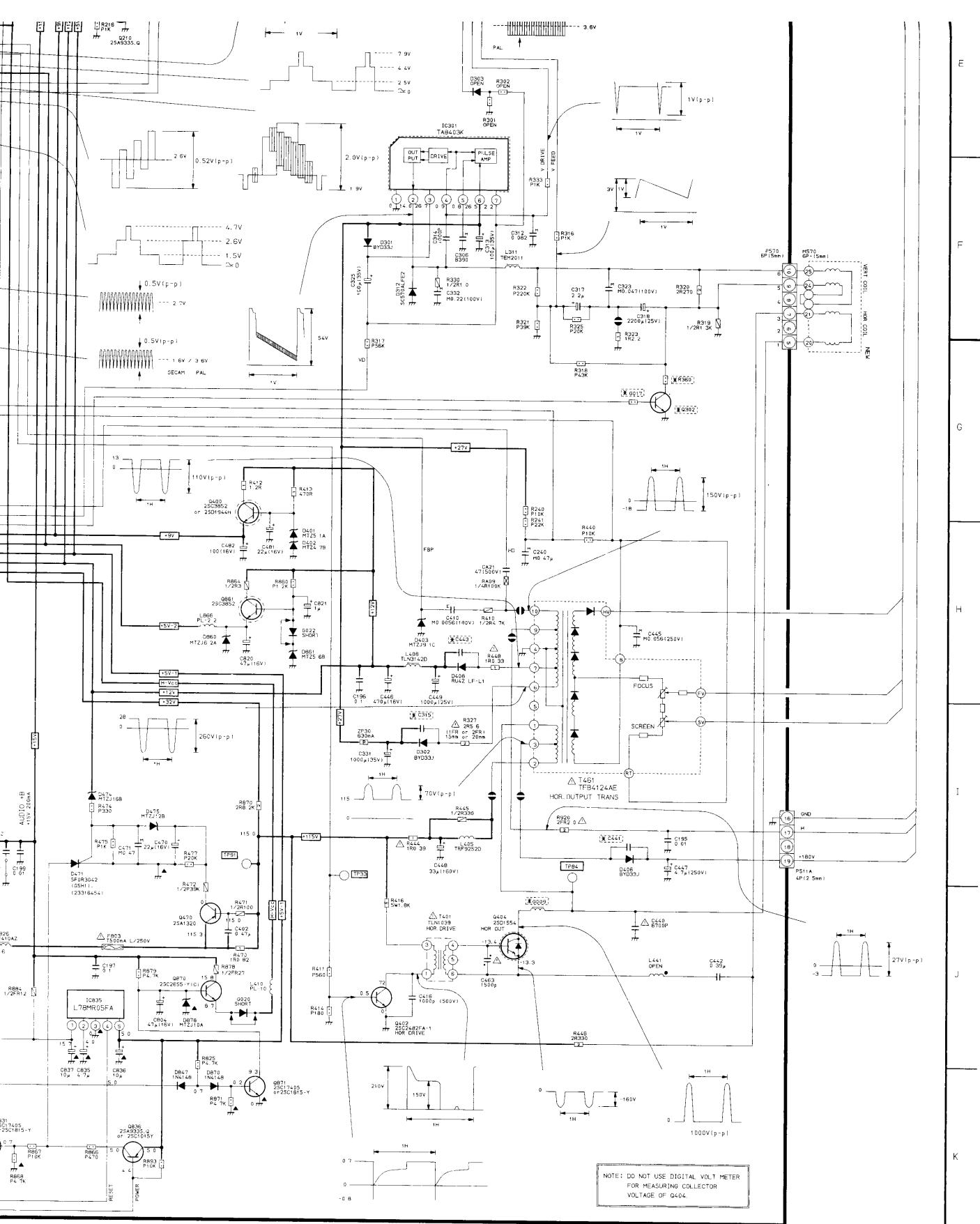








MODE	R001	R002
TB RB	OPEN	P1K
TD RD TN RN	P33K	P7.5K
TF RF	P33K	P27K
TS RS	P33K	P150K
TR	OPEN	



R001	R002
OPEN	P1K
P30K	P2.5K
P33K	P27K
P33K	P150K
P33K	P5K

1480TB/1480RB 1/2  
PK2679



# SCHEMATIC DIAGRAM

**MODEL : 1480TB / 1480TBW (2/2)**

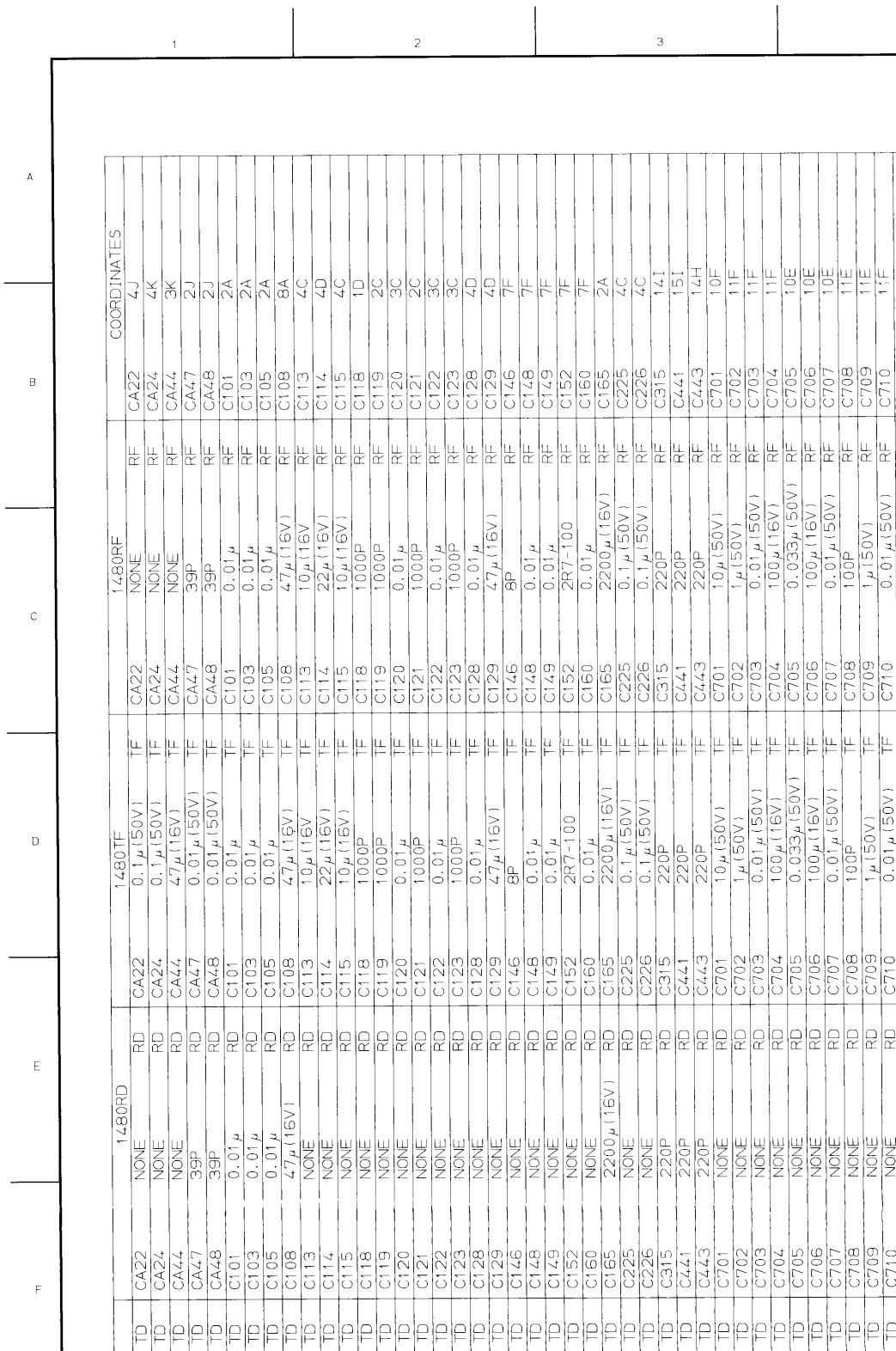
0 3 0 - 9 8 0 3

## **1480RB / 1480RBW**

**OBSERVATIONS**

1. Voltage  
volts
2. All waveforms
3. Waveform
4. Make a  
BRIDGE  
picture

**CAUTION:** The international hazard symbols “” in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 3. Do not degrade the safety of the receiver through improper servicing.



**(2/2)**

### OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltages read with VTVM from point shown to chassis ground, line voltage 220 volts, colour bar signal. Voltages reading may vary  $\pm 20\%$ .
2. All waveforms are taken using a wide band oscilloscope and a low capacity probe.
3. Waveforms are taken using a standard colour bar signal.
4. Make sure that CONTRAST and COLOUR controls are in mid position and BRIGHTNESS control is almost in maximum position. Set other controls for best picture.

### NOTES:

1. D.C. resistance values are approximate. These are measured at room temperature.
2. The circuits are subject to change.
3.  : Solder links.

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on page

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ID	C226	NONE	RD	C226	0.1 $\mu$ (50V)	TF	C226	0.1 $\mu$ (50V)	RF	C226	4C
ID	C315	220P	RD	C315	220P	TF	C315	220P	RF	C315	141
ID	C441	220P	RD	C441	220P	TF	C441	220P	RF	C441	151
ID	C443	220P	RD	C443	220P	TF	C443	220P	RF	C443	14H
ID	C701	NONE	RD	C701	10 $\mu$ (50V)	TF	C701	10 $\mu$ (50V)	RF	C701	10F
ID	C702	NONE	RD	C702	1 $\mu$ (50V)	TF	C702	1 $\mu$ (50V)	RF	C702	11F
ID	C703	NONE	RD	C703	0.01 $\mu$ (50V)	TF	C703	0.01 $\mu$ (50V)	RF	C703	11E
ID	C704	NONE	RD	C704	100 $\mu$ (16V)	TF	C704	100 $\mu$ (16V)	RF	C704	11F
ID	C705	NONE	RD	C705	0.033 $\mu$ (50V)	TF	C705	0.033 $\mu$ (50V)	RF	C705	10E
ID	C706	NONE	RD	C706	100 $\mu$ (16V)	TF	C706	100 $\mu$ (16V)	RF	C706	10E
ID	C707	NONE	RD	C707	0.01 $\mu$ (50V)	TF	C707	0.01 $\mu$ (50V)	RF	C707	10E
ID	C708	NONE	RD	C708	100P	TF	C708	100P	RF	C708	11E
ID	C709	NONE	RD	C709	1 $\mu$ (50V)	TF	C709	1 $\mu$ (50V)	RF	C709	11E
ID	C710	NONE	RD	C710	0.01 $\mu$ (50V)	TF	C710	0.01 $\mu$ (50V)	RF	C710	11F
ID	D101	1N4148	RD	D101	1N4148	TF	D101	1N4148	RF	D101	2B
ID	D102	NONE	RD	D102	1N4148	TF	D102	1N4148	RF	D102	8A
ID	D103	NONE	RD	D103	1SS110	TF	D103	1SS110	RF	D103	2C
ID	D104	NONE	RD	D104	1SS110	TF	D104	1SS110	RF	D104	2C
ID	D105	NONE	RD	D105	MTZ2-7B	TF	D105	MTZ2-7B	RF	D105	7F
ID	D106	NONE	RD	D106	1SS110	TF	D106	1SS110	RF	D106	7F
ID	G002	SHORT	RD	G002	NONE	TF	G002	NONE	RF	G002	7C
ID	G005	NONE	RD	G005	SHORT	TF	G005	SHORT	RF	G005	4H
ID	G006	NONE	RD	G006	SHORT	TF	G006	SHORT	RF	G006	7E
ID	G012	NONE	RD	G012	NONE	TF	G012	NONE	RF	G012	6D
ID	G015	NONE	RD	G015	SHORT	TF	G015	SHORT	RF	G015	11F
ID	G018	SHORT	RD	G018	NONE	TF	G018	NONE	RF	G018	10E
ID	G21	NONE	RD	G21	SHORT	TF	G21	NONE	RF	G21	21
ID	G22	NONE	RD	G22	SHORT	TF	G22	NONE	RF	G22	21
ID	G23	NONE	RD	G23	SHORT	TF	G23	NONE	RF	G23	21
ID	G24	SHORT	RD	G24	NONE	TF	G24	SHORT	RF	G24	21
ID	G25	SHORT	RD	G25	NONE	TF	G25	SHORT	RF	G25	21
ID	G27	NONE	RD	G27	SHORT	TF	G27	SHORT	RF	G27	21
ID	G29	SHORT	RD	G29	SHORT	TF	G29	SHORT	RF	G29	2B
ID	G32	NONE	RD	G32	SHORT	TF	G32	SHORT	RF	G32	6F
ID	G33	NONE	RD	G33	SHORT	TF	G33	SHORT	RF	G33	6F
ID	G42	SHORT	RD	G42	NONE	TF	G42	SHORT	RF	G42	21
ID	G44	NONE	RD	G44	SHORT	TF	G44	SHORT	RF	G44	4H
ID	G46	NONE	RD	G46	SHORT	TF	G46	SHORT	RF	G46	3J
ID	G47	SHORT	RD	G47	NONE	TF	G47	NONE	RF	G47	6D
ID	G001	NONE	RD	G001	1SS110	TF	G001	1SS110	RF	G001	8F
ID	G004	SHORT	RD	G004	2.2 $\mu$ (16V)	TF	G004	2.2 $\mu$ (16V)	RF	G004	9E
ID	G005	NONE	RD	G005	P100	TF	G005	P100	RF	G005	2C
ID	G006	NONE	RD	G006	P100	TF	G006	P100	RF	G006	3C
ID	G008	SHORT	RD	G008	1SS110	TF	G008	1SS110	RF	G008	8F
ID	G009	TEV2011	RD	G009	TEM2011	TF	G009	TEM2011	RF	G009	14J
ID	G010	P68	RD	G010	P68	TF	G010	P68	RF	G010	8A
ID	G011	P100	RD	G011	P100	TF	G011	P100	RF	G011	9F
ID	G017	NONE	RD	G017	P47K	TF	G017	NONE	RF	G017	15G
ID	G101	SHORT	RD	G101	P12K	TF	G101	P12K	RF	G101	8A
ID	H001	TN-EGA13X2 EGAD	RD	H001	TN-EGA13 VS	TF	H001	TN-EGA13 VS	RF	H001	3B
ID	I0A1	P83C055BBP/132D	IC01	I0A1	SAA2902P/084F	TF	I0A1	P83C055BBP/132E	RF	I0A1	3H
ID	I0A2	NONE	RD	I0A2	STV8225	TF	I0A2	STV8225	RF	I0A2	4C
ID	I0A4	NONE	RD	I0A4	TEM2011	TF	I0A4	TEM2011	RF	I0A4	2J
ID	I0A5	NONE	RD	I0A5	TEM2011	TF	I0A5	TEM2011	RF	I0A5	2J
ID	I0A6	TRE4330AJ	RD	I0A6	NONE	TF	I0A6	TRF4330AJ	RF	I0A6	3J
ID	I101	TRE4R68AJ	RD	I101	TRF4R68AJ	TF	I101	TRF4R68AJ	RF	I101	3B
ID	I103	NONE	RD	I103	TRF4L019	TF	I103	TRF4L019	RF	I103	2C
ID	I104	NONE	RD	I104	TRF43R3AF	TF	I104	TRF43R3AF	RF	I104	4D
ID	I105	TRF9220	RD	I105	TRF9220	TF	I105	TRF9220	RF	I105	9A
ID	I108	TRF4100CJ	RD	I108	TRF4829AJ	TF	I108	TRF4829AJ	RF	I108	9F
ID	I161	TRF1239AV	RD	I161	NEW	TF	I161	NEW	RF	I161	E9
ID	J001	NONE	RD	J001	TRF4100AF	TF	J001	TRF4100AF	RF	J001	11F
ID	L702	NONE	RD	L702	TRF4100AF	TF	L702	TRF4100AF	RF	L702	10E
ID	P801	POWER CORD	RD	P801	POWER CORD	TF	P801	POWER CORD	RF	P801	8L
ID	Q009	NONE	RD	Q009	2SC1815-Y	TF	Q009	2SC1815-Y	RF	Q009	5H
ID	Q013	NONE	RD	Q013	RNI203	TF	Q013	RNI203	RF	Q013	5H
ID	Q014	NONE	RD	Q014	LA7910	TF	Q014	LA7910	RF	Q014	2B
ID	Q018	NONE	RD	Q018	2SC388ATM	TF	Q018	2SC388ATM	RF	Q018	2D
ID	Q019	NONE	RD	Q019	RNI206	TF	Q019	RNI206	RF	Q019	6F
ID	Q022	NONE	RD	Q022	2SC1815-Y	TF	Q022	2SC1815-Y	RF	Q022	6F
ID	Q032	NONE	RD	Q032	2SC1815-Y	TF	Q032	2SC1815-Y	RF	Q032	13E
ID	Q501	B123IN	RD	Q501	TB1238N	TF	Q501	TB1238N	RF	Q501	15G

## **EXPRESSION**

## **NOTES:**

1. D.C. resistance value of a principal transformer is shown in this schematic diagram. These are measured for separated from the circuit.
2. The circuits are subject to change without notice.
3.  : Solder links.

## VALUE OF RESISTOR, CAPACITOR and

1. Resistance is shown in ohm,  $k=1,000$ , M
2. Unless otherwise noted in schematic, capacitors are specified in  $\mu F$  and the values more than 1 in  $\mu F$
3. Unless otherwise noted in schematic, inductors are specified in  $\mu H$ , and the values less than 1 in  $\mu H$

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## REGRESSION

#### **MEASUREMENT OF RESISTOR, CAPACITOR and INDUCTOR**

Resistance is shown in ohm.  $k=1,000$ .  $M=1,000,000$

less other wise noted in schematic, all capacitor values less than 1 are expressed in  $\mu\text{F}$  and the values more than 1 in  $\text{pF}$ .

less otherwise noted in schematic, all inductor values more than 1 are expressed in  $\mu\text{H}$ , and the values less than 1 in H.

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C225	C225	NONE	TB	C225	NONE	RB	C225	NONE	TD	C225	NONE	RD
C226	C226	NONE	TB	C226	NONE	RB	C226	NONE	TD	C226	NONE	RD
C315	C315	NONE	TB	C315	NONE	RB	C315	220P	TD	C315	220P	RD
C441	C441	NONE	TB	C441	NONE	RB	C441	220P	TD	C441	220P	RD
C443	C443	NONE	TB	C443	NONE	RB	C443	220P	TD	C443	220P	RD
C701	C701	NONE	TB	C701	NONE	RB	C701	NONE	TD	C701	NONE	RD
C702	C702	NONE	TB	C702	NONE	RB	C702	NONE	TD	C702	NONE	RD
C703	C703	NONE	TB	C703	NONE	RB	C703	NONE	TD	C703	NONE	RD
C704	C704	NONE	TB	C704	NONE	RB	C704	NONE	TD	C704	NONE	RD
C705	C705	NONE	TB	C705	NONE	RB	C705	NONE	TD	C705	NONE	RD
C706	C706	NONE	TB	C706	NONE	RB	C706	NONE	TD	C706	NONE	RD
C707	C707	NONE	TB	C707	NONE	RB	C707	NONE	TD	C707	NONE	RD
C708	C708	NONE	TB	C708	NONE	RB	C708	NONE	TD	C708	NONE	RD
C709	C709	NONE	TB	C709	NONE	RB	C709	NONE	TD	C709	NONE	RD
C710	C710	NONE	TB	C710	NONE	RB	C710	NONE	TD	C710	NONE	RD
D101	D101	NONE	TB	D101	NONE	RB	D101	1N4148	TD	D101	1N4148	RD
D102	D102	NONE	TB	D102	NONE	RB	D102	NONE	TD	D102	NONE	RD
D103	D103	NONE	TB	D103	NONE	RB	D103	NONE	TD	D103	NONE	RD
D104	D104	NONE	TB	D104	NONE	RB	D104	NONE	TD	D104	NONE	RD
D105	D105	NONE	TB	D105	NONE	RB	D105	NONE	TD	D105	NONE	RD
D106	D106	NONE	TB	D106	NONE	RB	D106	NONE	TD	D106	NONE	RD
GJ02	GJ02	SHORT	TB	GJ02	SHORT	RB	GJ02	SHORT	TD	GJ02	SHORT	RD
GJ05	GJ05	NONE	TB	GJ05	NONE	RB	GJ05	NONE	TD	GJ05	NONE	RD
GJ06	GJ06	NONE	TB	GJ06	NONE	RB	GJ06	NONE	TD	GJ06	NONE	RD
GJ12	GJ12	NONE	TB	GJ12	NONE	RB	GJ12	NONE	TD	GJ12	NONE	RD
GJ15	GJ15	NONE	TB	GJ15	NONE	RB	GJ15	NONE	TD	GJ15	NONE	RD
GJ18	GJ18	SHORT	TB	GJ18	SHORT	RB	GJ18	SHORT	TD	GJ18	SHORT	RD
GJ21	GJ21	SHORT	TB	GJ21	None	RB	GJ21	None	TD	GJ21	None	RD
GJ22	GJ22	SHORT	TB	GJ22	None	RB	GJ22	None	TD	GJ22	None	RD
GJ23	GJ23	SHORT	TB	GJ23	None	RB	GJ23	None	TD	GJ23	None	RD
GJ24	GJ24	NONE	TB	GJ24	SHORT	RB	GJ24	None	TD	GJ24	SHORT	RD
GJ25	GJ25	NONE	TB	GJ25	SHORT	RB	GJ25	None	TD	GJ25	SHORT	RD
GJ27	GJ27	NONE	TB	GJ27	None	RB	GJ27	None	TD	GJ27	None	RD
GJ29	GJ29	NONE	TB	GJ29	None	RB	GJ29	None	TD	GJ29	None	RD
GJ32	GJ32	NONE	TB	GJ32	None	RB	GJ32	None	TD	GJ32	None	RD
GJ33	GJ33	NONE	TB	GJ33	None	RB	GJ33	None	TD	GJ33	None	RD
GJ42	GJ42	NONE	TB	GJ42	SHORT	RB	GJ42	None	TD	GJ42	SHORT	RD
GJ44	GJ44	NONE	TB	GJ44	None	RB	GJ44	None	TD	GJ44	None	RD
GJ46	GJ46	SHORT	TB	GJ46	None	RB	GJ46	None	TD	GJ46	None	RD
GJ47	GJ47	SHORT	TB	GJ47	SHORT	RB	GJ47	SHORT	TD	GJ47	SHORT	RD
G001	G001	SHORT	TB	G001	SHORT	RB	G001	None	TD	G001	None	RD
G004	G004	SHORT	TB	G004	SHORT	RB	G004	None	TD	G004	SHORT	RD
G005	G005	NONE	TB	G005	NONE	RB	G005	NONE	TD	G005	NONE	RD
G006	G006	NONE	TB	G006	NONE	RB	G006	NONE	TD	G006	NONE	RD
G008	G008	NONE	TB	G008	NONE	RB	G008	NONE	TD	G008	SHORT	RD
G009	G009	SHORT	TB	G009	SHORT	RB	G009	None	TD	G009	TEM2011	RD
G010	G010	SHORT	TB	G010	SHORT	RB	G010	P004	TD	G010	P004	RD
G011	G011	SHORT	TB	G011	None	RB	G011	P100	TD	G011	P100	RD
G017	G017	P47K	TB	G017	None	RB	G017	P27K	TD	G017	None	RD
G101	G101	SHORT	TB	G101	SHORT	RB	G101	SHORT	TD	G101	SHORT	RD
H001	H001	TN-UFB13BX1	TB	H001	TN-UFB13BX1	RB	H001	TN-EGA13X2	ECAP	H001	TN-EGA13X2	ECAP
ICA01	ICA01	SAA52902P/087FB	TB	ICA01	P83C055BBP/192B	RB	ICA01	SA52902P/087D	ICAO1	P83C055BBP/192D	ICAO1	RD
IC102	IC102	NONE	TB	IC102	NONE	RB	IC102	NONE	TD	IC102	NONE	RD
LA04	LA04	TEM2011	TB	LA04	NONE	RB	LA04	TEM2011	TD	LA04	NONE	RD
LA05	LA05	TEM2011	TB	LA05	NONE	RB	LA05	NONE	TD	LA05	NONE	RD
LA06	LA06	NONE	TB	LA06	TRE4330AJ	RB	LA06	NONE	TD	LA06	TRE4330AJ	RD
L101	L101	TRE4R7AJ	TB	L101	TRE4R7AJ	RB	L101	TRE4R6BAJ	TD	L101	TRE4R6BAJ	RD
L103	L103	NONE	TB	L103	NONE	RB	L103	NONE	TD	L103	NONE	RD
L104	L104	NONE	TB	L104	NONE	RB	L104	NONE	TD	L104	NONE	RD
L105	L105	TRF9221	TB	L105	TRF9221	RB	L105	TRF9220	TD	L105	TRF9220	RD
L108	L108	TRF41004J	TB	L108	TRF41004J	RB	L108	TRF41004J	TD	L108	TRF41004J	RD
L161	L161	TRF1239AV	TB	L161	TRF1239AV	RB	L161	TRF1239AV	TD	L161	TRF1239AV	RD
L701	L701	NONE	TB	L701	NONE	RB	L701	NONE	TD	L701	NONE	RD
L702	L702	NONE	TB	L702	NONE	RB	L702	NONE	TD	L702	NONE	RD
P801	P801	POWER CORD	TB	P801	POWER CORD	RB	P801	POWER CORD	TD	P801	POWER CORD	RD
QA09	QA09	NONE	TB	QA09	NONE	RB	QA09	NONE	TD	QA09	NONE	RD
QA13	QA13	NONE	TB	QA13	NONE	RB	QA13	NONE	TD	QA13	NONE	RD
Q103	Q103	NONE	TB	Q103	NONE	RB	Q103	LA7910	TD	Q103	LA7910	RD
Q104	Q104	NONE	TB	Q104	NONE	RB	Q104	NONE	TD	Q104	NONE	RD
Q108	Q108	NONE	TB	Q108	NONE	RB	Q108	NONE	TD	Q108	NONE	RD
Q109	Q109	NONE	TB	Q109	NONE	RB	Q109	NONE	TD	Q109	NONE	RD
Q212	Q212	2SC1815-Y	TB	Q212	2SC1815-Y	RB	Q212	2SC1815-Y	TD	Q212	2SC1815-Y	RD

L702	P801	POWER CORD	TB	L702	NONE	RB	L702	NONE	TD	L702	NONE	RD
P809	QA09	NONE	TB	QA09	NONE	RB	P801	POWER CORD	TD	P801	POWER CORD	RD
QA13	NONE	TB	QA13	NONE	NONE	RB	QA09	NONE	TD	QA13	NONE	RD
Q103	NONE	TB	Q103	NONE	NONE	RB	Q103	LA7910	TD	Q103	LA7910	RD
Q104	NONE	TB	Q104	NONE	NONE	RB	Q104	NONE	TD	Q104	NONE	RD
Q108	NONE	TB	Q108	NONE	NONE	RB	Q108	NONE	TD	Q108	NONE	RD
Q109	NONE	TB	Q109	NONE	NONE	RB	Q109	NONE	TD	Q109	NONE	RD
Q212	2SC1815-Y	TB	Q212	NONE	NONE	RB	Q212	2SC1815-Y	TD	Q212	NONE	RD
Q302	2SC1815-Y	TB	Q302	NONE	NONE	RB	Q302	2SC1815-Y	TD	Q302	NONE	RD
Q501	TB1231N	TB	Q501	TB1231N	NONE	RB	Q501	TB1231N	TD	Q501	TB1231N	RD
Q560	NONE	TB	Q560	NONE	NONE	RB	Q560	NONE	TD	Q560	NONE	RD
Q602	NONE	TB	Q602	NONE	NONE	RB	Q602	NONE	TD	Q602	NONE	RD
Q614	NONE	TB	Q614	NONE	NONE	RB	Q614	NONE	TD	Q614	NONE	RD
RA10	P1K	TB	RA10	NONE	NONE	RB	RA10	P1K	TD	RA10	NONE	RD
RA11	P1.8K	TB	RA11	NONE	NONE	RB	RA11	P1.8K	TD	RA11	NONE	RD
RA13	NONE	TB	RA13	NONE	NONE	RB	RA13	NONE	TD	RA13	NONE	RD
RA18	NONE	TB	RA18	NONE	NONE	RB	RA18	NONE	TD	RA18	NONE	RD
RA37	P27K	TB	RA37	NONE	NONE	RB	RA37	P27K	TD	RA37	NONE	RD
RA40	P1K	TB	RA40	NONE	NONE	RB	RA40	P1K	TD	RA40	NONE	RD
RA62	P22K	TB	RA62	P22K	NONE	RB	RA62	P22K	TD	RA62	P22K	RD
RA79	NONE	TB	RA79	NONE	NONE	RB	RA79	NONE	TD	RA79	NONE	RD
R001	NONE	TB	R001	NONE	NONE	RB	R001	P33K	TD	R001	P33K	RD
R002	P1K	TB	R002	P1K	NONE	RB	R002	P7.5K	TD	R002	P7.5K	RD
R107	NONE	TB	R107	NONE	NONE	RB	R107	P1K	TD	R107	P1K	RD
R120	NONE	TB	R120	NONE	NONE	RB	R120	P1K	TD	R120	P1K	RD
R121	NONE	TB	R121	NONE	NONE	RB	R121	P3.9K	TD	R121	P3.9K	RD
R125	NONE	TB	R125	NONE	NONE	RB	R125	NONE	TD	R125	NONE	RD
R126	NONE	TB	R126	NONE	NONE	RB	R126	NONE	TD	R126	NONE	RD
R127	NONE	TB	R127	NONE	NONE	RB	R127	NONE	TD	R127	NONE	RD
R128	NONE	TB	R128	NONE	NONE	RB	R128	NONE	TD	R128	NONE	RD
R129	NONE	TB	R129	NONE	NONE	RB	R129	NONE	TD	R129	NONE	RD
R131	NONE	TB	R131	NONE	NONE	RB	R131	NONE	TD	R131	NONE	RD
R133	NONE	TB	R133	NONE	NONE	RB	R133	NONE	TD	R133	NONE	RD
R164	NONE	TB	R164	NONE	NONE	RB	R164	NONE	TD	R164	NONE	RD
R165	NONE	TB	R165	NONE	NONE	RB	R165	NONE	TD	R165	NONE	RD
R166	NONE	TB	R166	NONE	NONE	RB	R166	NONE	TD	R166	NONE	RD
R167	NONE	TB	R167	NONE	NONE	RB	R167	NONE	TD	R167	NONE	RD
R168	NONE	TB	R168	NONE	NONE	RB	R168	NONE	TD	R168	NONE	RD
R169	NONE	TB	R169	NONE	NONE	RB	R169	NONE	TD	R169	NONE	RD
R170	NONE	TB	R170	NONE	NONE	RB	R170	NONE	TD	R170	NONE	RD
R172	NONE	TB	R172	NONE	NONE	RB	R172	NONE	TD	R172	NONE	RD
R173	NONE	TB	R173	NONE	NONE	RB	R173	P270	TD	R173	P270	RD
R175	P470	TB	R175	P470	NONE	RB	R175	NONE	TD	R175	NONE	RD
R177	NONE	TB	R177	NONE	NONE	RB	R177	NONE	TD	R177	NONE	RD
R181	P220	TB	R181	P220	NONE	RB	R181	P56	TD	R181	P56	RD
R204	P730	TB	R204	NONE	NONE	RB	R204	P750	TD	R204	NONE	RD
R220	P1K	TB	R220	NONE	NONE	RB	R220	P1K	TD	R220	NONE	RD
R225	P1K	TB	R225	NONE	NONE	RB	R225	P1K	TD	R225	NONE	RD
R360	P15K	TB	R360	NONE	NONE	RB	R360	P15K	TD	R360	NONE	RD
R580	P10K	TB	R580	NONE	NONE	RB	R580	P10K	TD	R580	NONE	RD
R606	NONE	TB	R606	NONE	NONE	RB	R606	NONE	TD	R606	NONE	RD
R609	NONE	TB	R609	NONE	NONE	RB	R609	NONE	TD	R609	NONE	RD
R632	NONE	TB	R632	NONE	NONE	RB	R632	NONE	TD	R632	NONE	RD
R633	NONE	TB	R633	NONE	NONE	RB	R633	NONE	TD	R633	NONE	RD
R706	NONE	TB	R706	NONE	NONE	RB	R706	NONE	TD	R706	NONE	RD
R707	NONE	TB	R707	NONE	NONE	RB	R707	NONE	TD	R707	NONE	RD
R708	NONE	TB	R708	NONE	NONE	RB	R708	NONE	TD	R708	NONE	RD
Z101	NONE	TB	Z101	NONE	NONE	RB	Z101	NONE	TD	Z101	NONE	RD
Z102	OFWJ1951M	TB	Z102	OFWJ1951M	NONE	RB	Z102	OFWJ1952M	TD	Z102	OFWJ1952M	RD
Z103	NONE	TB	Z103	NONE	NONE	RB	Z103	F1LTGF1031	TD	Z103	F1LTGF1031	RD
Z104	SFE6.0MB	TB	Z104	SFE6.0MB	NONE	RB	Z104	NONE	TD	Z104	NONE	RD
Z105	TCF1012	TB	Z105	TCF1012	NONE	RB	Z105	TCF1011	TD	Z105	TCF1011	RD
Z106	NONE	TB	Z106	NONE	NONE	RB	Z106	NONE	TD	Z106	NONE	RD

